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## ***Chapter 12***



# ***Toxics Release Inventory Data for Fabricated Metals (SIC Code 34)***

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## **A Look at the Fabricated Metal Products Industry (SIC Code 34)**

The fabricated metal products industry (SIC code 34) manufactures ferrous and nonferrous metal products ranging from metal cans to hardware to nonelectric heating equipment and plumbing fixtures. Structural products classified in this sector include iron, steel, and other metal fabricated for use in bridges and buildings, along with metal sections for ships and boats. Fabricated plate work includes power boilers, marine boilers, industrial processing and storage vessels, heat exchangers, and similar products. The sector also produces screw machine products (unassembled parts made to specification on a job basis) and standard bolts, nuts, screws, and other fasteners. The metal forgings and stampings group forges iron, steel, and nonferrous metals for aircraft, automobiles, railroads, and other uses. The sector also performs electroplating and finishing of metals and metal products, along with metal cutting, engraving, enameling, and galvanizing. In addition, small arms, ammunition, and miscellaneous ordnance are classified in SIC code

34, as are valves, springs, metal foil, pipe, and other miscellaneous fabricated metal products.

Box 12-1 lists Standard Industrial Classification (SIC) codes and their designations for this sector. In TRI, SIC codes are given as reported by the facilities; these may differ from information in economic and other data collections.

The fabricated metal products sector shipped products valued at \$214.01 billion in 1996, up from \$204.4 billion in 1995 (both in current dollars). The sector employed nearly 1.5 million in both years. Employment in fabricated metal products has increased through the 1990s. From 1989 to 1996, production in this sector rose 13.2%, somewhat slower growth than the 17.6% average for all U.S. manufacturing (see Chapter 1, Table 1-10).

Three industry groups in SIC code 34 accounted for the bulk of the value of shipments and employment in 1996. Fabricated structural metal products (SIC code 344 at the three-digit level) shipped products valued at \$59.39 billion and employed 432,000. Metal forgings and stampings (SIC code 346) recorded \$41.28 billion in shipments and 259,000 in employment.



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### Box 12-1. SIC Code 34, Fabricated Metal Products, Except Machinery and Transportation Equipment: Codes and Classifications

SIC Code	Industry Description
<b>343 Heating Equipment, Except Electric and Warm Air; and Plumbing Fixtures</b>	
3431 Enameled Iron and Metal Sanitary Ware	Manufacture of enameled iron, cast iron, or pressed metal sanitary ware.
3432 Plumbing Fixture Fittings and Trim	Manufacture of metal plumbing fixture fittings and trim. Assembly of plastics components into plumbing fixture fittings.
3433 Heating Equipment, Except Electric and Warm Air Furnaces	Manufacture of heating equipment, except electric and warm air furnaces.
<b>344 Fabricated Structural Metal Products</b>	
3441 Fabricated Structural Metal	Fabrication of iron and steel or other metal for structural purposes, such as bridges, buildings, and sections for ships, boats, and barges.
3442 Metal Doors, Sash, Frames, Molding, and Trim	Manufacture of ferrous and nonferrous metal doors, sash, window and door frames and screens, molding, and trim.
3443 Fabricated Plate Work (Boiler Shops)	Manufacture of power and marine boilers, pressure and nonpressure tanks, processing and storage vessels, heat exchangers, weldments and similar products, by cutting, forming, and joining metal plates, shapes, bars, sheet, pipe mill products, and tubing to custom or standard design, for factory or field assembly.
3444 Sheet Metal Work	Manufacture of sheet metal work for buildings. Manufacture of stovepipes, light tanks, and other products of sheet metal.
3446 Architectural Metal Work	Manufacture of architectural and ornamental metal work, such as stairs and staircases, open steel flooring (grating), fire escapes, grilles, railings, and fences and gates, except those made from wire.
3448 Prefabricated Metal Buildings and Components	Manufacture of portable and other prefabricated metal buildings and parts and prefabricated exterior metal panels.
3449 Miscellaneous Structural Metal Work	Manufacture of miscellaneous structural metal work, such as metal plaster bases, fabricated bar joists, and concrete reinforcing bars. Custom roll forming of metal.
<b>345 Screw Machine Products, and Bolts, Nuts, Screws, Rivets, and Washers</b>	
3451 Screw Machine Products	Manufacture of automatic or hand-screw machine products from rod, bar, or tube stock of metal, fiber, plastics, or other material. (Includes a wide variety of unassembled parts, usually produced on a job or order basis.)
3452 Bolts, Nuts, Screws, Rivets, and Washers	Manufacture of metal bolts, nuts, screws, rivets, washers, formed and threaded wire goods, and special industrial fasteners.
<b>346 Metal Forgings and Stampings</b>	
3462 Iron and Steel Forgings	Manufacture of metal forgings or metal stampings, generally on a job or order basis.
3463 Nonferrous Forgings	Manufacture of nonferrous forgings, with or without the use of dies.
3465 Automotive Stampings	Manufacture of automotive stampings, such as body parts, hubs, and trim.
3466 Crowns and Closures	Manufacture of metal crowns and closures, such as bottle caps.
3469 Metal Stampings, nec*	Manufacture of miscellaneous metal stampings and spun products, including porcelain enameled products. Includes household appliance housing and parts, cooking and kitchen utensils, and other non-automotive job stampings.

\*nec: not elsewhere classified; these are generally referred to as "miscellaneous" products in their categories.



**Box 12-1. SIC Code 34, Fabricated Metal Products, Except Machinery and Transportation Equipment: Codes and Classifications, Continued**

SIC Code	Industry Description
<b>347 Coating, Engraving, and Allied Services</b>	
3471 Electroplating, Plating, Polishing, Anodizing, and Coloring	Electroplating, plating, anodizing, coloring, and finishing of metals and formed products for the trade or, on purchased metals or formed products, for the establishment's own use.
3479 Coating, Engraving, and Allied Services, nec*	Enameling, lacquering, and varnishing metal products. Hot dip galvanizing of mill sheets, plates and bars, castings, and formed products of iron and steel; hot dip coating such items with aluminum, lead, or zinc; retinning of cans and utensils. Engraving, chasing, and etching of jewelry, silverware, notarial and other seals, and other metal products for purposes other than printing. Providing other miscellaneous metal services. (All activities are performed for the trade or, on purchased metals or products, for the establishment's own use.)
<b>348 Ordnance and Accessories, Except Vehicles and Guided Missiles</b>	
3482 Small Arms Ammunition	Manufacture of ammunition for small arms (bore of 30 millimeters or less).
3483 Ammunition, Except For Small Arms	Manufacture of miscellaneous ammunition. Loading and assembling ammunition more than 30 millimeters, including component parts. Manufacture of bombs, mines, torpedoes, grenades, depth charges, chemical warfare projectiles, and their component parts.
3484 Small Arms	Manufacture of small firearms and their parts. Manufacture of certain larger weapons carried and employed by an individual (such as grenade launchers and heavy field machine guns).
3489 Ordnance and Accessories, nec*	Manufacture of miscellaneous ordnance and accessories, such as naval, aircraft, anti-aircraft, tank, coast, and field artillery.
<b>349 Miscellaneous Fabricated Metal Products</b>	
3491 Industrial Valves	Manufacture of industrial valves.
3492 Fluid Power Valves and Hose Fittings	Manufacture of hydraulic and pneumatic valves, hose and tube fittings, and hose assemblies for fluid power systems.
3493 Steel Springs, Except Wire	Manufacture of leaf springs, hot wound springs, and coiled flat springs.
3494 Valves and Pipe Fittings, nec*	Manufacture of miscellaneous metal valves and pipe fittings, such as plumbing and heating valves, and pipe fittings, flanges, and unions, except from purchased pipes.
3495 Wire Springs	Manufacture of wire springs from purchased wires.
3496 Miscellaneous Fabricated Wire Products	Manufacture of miscellaneous fabricated wire products from purchased wire, such as non-insulated wire rope and cable, fencing, screening, netting, paper machine wire cloth, hangers, paper clips, kitchenware, and wire carts.
3497 Metal Foil and Leaf	Manufacture of gold, silver, tin, and other metal foil (including converted metal foil) and leaf. Converting of metal foil (including aluminum) into wrappers, cookware, dinnerware, and containers (except bags and liners). (Excludes manufacture of plain aluminum foil.)
3498 Fabricated Pipe and Pipe Fittings	Fabrication of pipe and pipe fittings from purchased metal pipe, by processes such as cutting, threading, and bending.
3499 Fabricated Metal Products, nec*	Manufacture of miscellaneous fabricated metal products, such as steel safes and vaults and similar fire or burglary resistive products, collapsible tubes of thin flexible metal, metal boxes, metal ladders, and metal household articles, such as ice cream freezers and ironing boards.

\*nec: not elsewhere classified; these are generally referred to as "miscellaneous" products in their categories.



Miscellaneous fabricated metal products (SIC code 349) had \$40.83 billion in value of shipments and employed 300,000.

Fabricated metal production includes a number of stages that can result in releases or waste management of TRI chemicals. Prominent operations in metal fabrication include forming (bending and shaping), machining (cutting and shearing), cleaning and stripping, and surface treatment and plating. Aqueous solutions, emulsions, and cutting oils (such as ethylene glycol) may be used to cool or lubricate metal pieces during cutting operations. Releases of glycol ethers to air may result from cutting operations as well as from coating processes. Air emissions of solvents such as xylene and toluene also may result from forming and cutting operations. Organic solvents, alkalines, and acids are used in cleaning and degreasing metal surfaces; these uses also may result in air emissions, particularly of solvents.

Finishing operations often include plating, which uses solutions bearing metal ions for deposition on the surface of the fabricated workpiece.

Chrome (hexavalent or trivalent), copper, gold, silver, cadmium, zinc, or nickel may be used in plating tanks. Polishing, hot dip coating, and etching are other finishing techniques. In plating and hot dip coating, metal pieces are plated or coated with another metal. The principal example of hot dip coating is galvanizing with zinc. Fabricated metal products may also be painted, using dry powder or solvent-based or water-borne formulations. Plating and finishing operations may result in solvent releases and in waste management of metals and other TRI chemicals.

## 1996 TRI Data for Fabricated Metals

Table 12-1 summarizes TRI reporting by the fabricated metals sector for 1996. The sector submitted 7,416 forms in 1996. Of these, 521 were Form A certification statements, certifying that a facility's total annual reportable amount of a TRI chemical was less than 500 pounds for the year and that the facility did not manufacture, process, or otherwise use more than 1 million pounds. (The Form A certification statement is explained in Chapter 1.)

### Sources

- Executive Office of the President, Office of Management and Budget, *Standard Industrial Classification Manual*, 1987: Standard Industrial Classification (SIC) codes and industry descriptions.
- U.S. *Industry & Trade Outlook '98*, DRI/McGraw Hill, Standard & Poor's, and U.S. Department of Commerce, International Trade Administration, 1998: economic analyses, also provides some information on environment and industrial processes for selected industries.
- U.S. Census Bureau, *1996 Annual Survey of Manufactures: Statistics for Industry Groups and Industries*, M96(AS)-1, February 1998 <<http://www.census.gov/prod/www/titles.html#mm>>: value of shipments and employment. Supplemental data from U.S. Census Bureau <<http://www.census.gov>> for some industries.
- U.S. Environmental Protection Agency, Office of Enforcement and Compliance Assurance, Office of Compliance, *Profile of the Fabricated Metal Products Industry*, Sector Notebook project, EPA/310-R-95-007, September 1995 <<http://es.epa.gov/oeca/sector/index.html>>: industry processes and technologies, pollutant sources, and selected economic data.
- U.S. Environmental Protection Agency, Office of Research and Development, *Guides to Pollution Prevention: The Fabricated Metal Products Industry*, EPA/625/7-90/006, July 1990 <<http://es.epa.gov/oeca/sector/index.html>>: industry processes and technologies, pollutant sources, and selected economic data.



The plating and polishing industry (SIC code 3471) submitted 1,241 forms, or 16.7% of the sector's total in 1996. The metal coating industry (SIC code 3479) submitted 883 forms (11.9%). A total of 688 forms (9.3%) reported more than one SIC code within SIC code 34; these "multiple-codes" forms are explained below. Two other industries in the fabricated metals sector submitted more than 600 forms each: miscellaneous fabricated metal products (SIC code 3499), 623 forms, and metal cans (SIC code 3411), 601 forms. These represented 8.4% and 8.1%, respectively, of all forms submitted by the sector in 1996.

The metal cans industry (SIC code 3411) reported the fabricated metals sector's largest total on- and off-site releases (24.8 million pounds) in 1996. This amount was 27.5% of the sector's total of 90.3 million pounds. The metal cans industry's reported releases consisted almost entirely of on-site releases: 24.7 million pounds or 35.2% of the sector's total of 70.3 million pounds. The miscellaneous metal stampings industry (SIC code 3469) ranked first for reporting of off-site releases, with 8.3 million pounds, or 41.4% of the sector's total of 19.9 million pounds. The metal coating industry (SIC code 3479) ranked second in all three summary release categories shown in Table 12-1: on-site releases (8.5 million pounds, or 12.0% of the sector's total), off-site releases (3.1 million pounds, or 15.5%), and total releases (11.6 million pounds, or 12.8%).

The plating and polishing industry (SIC code 3471) ranked first in the sector for other on-site waste management, reporting 55.6 million pounds, or 19.7% of the sector's total of 282.7 million pounds. The cutlery industry (SIC code 3421) reported the second-largest amount, 46.5 million pounds (16.4%).

Some facilities in the fabricated metals sector manufacture related, but distinct, product lines

that are classified in different SIC codes. A facility may forge iron and steel (SIC code 3462) and nonferrous metals (SIC code 3463). Another facility may manufacture miscellaneous hardware (SIC code 3429) and also perform plating and polishing (SIC code 3471) for the fabricated metals trade. Such facilities may report multiple SIC codes on their TRI forms. (Box 1-5 in Chapter 1 further explains reporting of multiple SIC codes and its affect on the analyses presented in the TRI data release.) In 1996, these multiple-codes forms reported the sector's largest amounts of transfers off-site for further waste management and total production-related waste.

The multiple-codes group reported 50.0 million pounds of transfers off-site for further waste management, 14.9% of the sector's 336.5 million pounds in this category. These forms also reported 100.1 million pounds of total production-related waste, 14.0% of the sector's total of 716.2 million pounds. For transfers off-site for further waste management, the plumbing fixture fittings and trim industry (SIC code 3432) ranked second with 41.5 million pounds (12.3%). For total production-related waste, the plating and polishing industry (SIC code 3471) ranked second with 90.4 million pounds (12.6%).

### Multiple SIC Codes in SIC Code 34

Table 12-2 further examines reporting on forms that reported more than one four-digit SIC code within SIC code 34 in 1996. The largest number of forms (96 forms) combined plating and polishing (SIC code 3471) and metal coating (SIC code 3479). The combination of fabricated structural metal (SIC code 3441) and fabricated plate work (SIC code 3443) submitted the second-largest number of multiple-codes forms (31 forms).

Among the multiple-codes forms, the combination of plating and polishing (SIC code 3471) and metal coating (SIC code 3479) reported the largest total on- and off-site releases, with 945,000 pounds. The



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**Table 12-1. Summary of TRI Information by 4-digit SIC Code, 1996: Fabricated Metals, SIC Code 34**

Total On- and Off-site Releases Rank	Total Production- related Waste Rank	SIC Code	Industry	Total Facilities Number	Total Forms Number	Form As Number	Total On-site Releases Pounds	Total Off-site Releases Pounds	Total On- and Off-site Releases Pounds
1	4	3411	Metal Cans	150	601	4	24,734,812	59,341	24,794,153
8	22	3412	Metal Barrels, Drums, & Pails	46	149	0	2,274,771	0	2,274,771
18	6	3421	Cutlery	18	37	3	720,956	83,229	804,185
23	29	3423	Hand & Edge Tools, nec*	33	68	2	367,187	43,042	410,229
37	36	3425	Saw Blades & Handsaws	12	21	2	7,057	60,330	67,387
10	10	3429	Hardware, nec*	55	158	4	1,242,921	632,806	1,875,727
31	30	3431	Metal Sanitary Ware	6	32	3	58,460	127,650	186,110
32	5	3432	Plumbing Fixture Fittings & Trim	34	92	1	70,851	69,729	140,580
27	31	3433	Heating Equipment, Except Electric	21	43	0	328,601	2,009	330,610
11	20	3441	Fabricated Structural Metal	132	341	159	1,682,724	141,818	1,824,542
7	27	3442	Metal Doors, Sash, & Trim	62	127	10	2,283,760	1,380	2,285,140
15	17	3443	Fabricated Plate Work (Boiler Shops)	91	269	22	1,424,326	92,391	1,516,717
13	26	3444	Sheet Metal Work	55	139	14	1,577,583	52,417	1,630,000
26	33	3446	Architectural Metal Work	7	24	1	228,864	108,861	337,725
16	19	3448	Prefabricated Metal Buildings	35	83	5	1,055,416	101,243	1,156,659
24	32	3449	Miscellaneous Metal Work	24	51	12	404,639	270	404,909
21	12	3451	Screw Machine Products	60	113	6	424,315	5,259	429,574
20	24	3452	Bolts, Nuts, Rivets, & Washers	62	139	12	373,233	81,970	455,203
9	11	3462	Iron & Steel Forgings	68	200	11	702,204	1,256,282	1,958,486
33	13	3463	Nonferrous Forgings	17	38	0	71,130	44,077	115,207
29	15	3465	Automotive Stampings	35	105	12	273,918	15,616	289,534
39	40	3466	Crowns & Closures	2	3	0	28,867	0	28,867
3	8	3469	Metal Stampings, nec*	144	303	27	2,451,432	8,254,646	10,706,078
4	2	3471	Plating & Polishing	551	1,241	29	4,102,006	2,739,869	6,841,875
2	3	3479	Metal Coating & Allied Services	301	883	33	8,459,218	3,094,957	11,554,175
28	18	3482	Small Arms Ammunition	14	50	2	106,877	222,280	329,157
36	37	3483	Ammunition, Exc. For Small Arms, nec*	4	5	0	69,364	0	69,364
34	34	3484	Small Arms	8	24	0	46,709	39,569	86,278
30	35	3489	Ordnance & Accessories, nec*	6	12	0	196,083	66	196,149
22	25	3491	Industrial Valves	30	59	7	397,685	19,568	417,253
38	28	3492	Fluid Power Valves & Hose Fittings	14	34	0	42,041	5,805	47,846
35	38	3493	Steel Springs, Except Wire	6	10	0	77,504	4,968	82,472
25	7	3494	Valves & Pipe Fittings, nec*	74	196	12	275,759	63,222	338,981
40	39	3495	Wire Springs	6	12	1	12,602	12,372	24,974
14	16	3496	Misc. Fabricated Wire Products	79	213	27	888,558	699,516	1,588,074
19	14	3497	Metal Foil & Leaf	16	47	0	432,014	40,523	472,537
17	23	3498	Fabricated Pipe & Fittings	36	81	4	743,525	95,250	838,775
6	9	3499	Fabricated Metal Products, nec*	289	623	34	5,467,702	323,144	5,790,846
3	3		Multiple within SIC Code 34	249	688	62	4,624,980	1,287,991	5,912,971
20	20		Invalid SIC Code within SIC Code 34	31	102	0	1,589,812	50,435	1,640,247
			Total for SIC Code 34	2,883	7,416	521	70,320,466	19,933,901	90,254,367

**Note:** **On-site Releases** from Section 5 of Form R. **On-site Waste Management** from Section 8 of Form R. **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Total Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. **Total Production-related Waste** sums Section 8 (Current Year, Column B) of Form R, except: **Non-production-related Waste** (remedial/catastrophic incidents). Facilities/forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category. One facility reported incorrectly in SIC code 3999 for 1996. The facility should have reported in SIC code 3499. The incorrectly reported amounts were as follows: 30 pounds of total releases, 3,209,773 pounds of other on-site waste management, 207,776 pounds of transfers off-site for further waste management and 3,417,119 pounds of total production-related waste.

\*nec: not elsewhere classified.



Table 12-1. Summary of TRI Information by 4-digit SIC Code, 1996: Fabricated Metals, SIC Code 34, Continued

SIC Code	Industry	Total Other On-site Waste Management Pounds	Total Transfers Off-site for Further Waste Management Pounds	Total Production-related Waste Pounds	Non-Production-related Waste Pounds
3411	Metal Cans	35,667,283	10,824,509	71,182,816	2,131
3412	Metal Barrels, Drums, & Pails	1,663,926	1,335,250	5,275,763	0
3421	Cutlery	46,494,092	457,713	47,731,906	0
3423	Hand & Edge Tools, nec*	896,310	678,473	1,982,201	0
3425	Saw Blades & Handsaws	0	298,513	378,514	0
3429	Hardware, nec*	7,414,322	9,789,085	19,565,567	1,936
3431	Metal Sanitary Ware	1,019,805	411,364	1,611,185	0
3432	Plumbing Fixture Fittings & Trim	8,938,665	41,492,381	50,408,702	0
3433	Heating Equipment, Except Electric	2,464	686,653	1,024,058	0
3441	Fabricated Structural Metal	96,333	7,516,467	6,021,248	33,230
3442	Metal Doors, Sash, & Trim	64,438	458,215	3,011,206	0
3443	Fabricated Plate Work (Boiler Shops)	1,415,576	4,797,964	8,249,623	110
3444	Sheet Metal Work	894,945	1,064,348	4,081,744	0
3446	Architectural Metal Work	180,396	422,383	830,928	0
3448	Prefabricated Metal Buildings	6,495,718	161,992	7,924,646	500
3449	Miscellaneous Metal Work	291,332	233,314	969,868	0
3451	Screw Machine Products	454,674	17,833,718	18,885,627	200
3452	Bolts, Nuts, Rivets, & Washers	2,986,542	1,187,571	4,660,551	0
3462	Iron & Steel Forgings	1,925,299	16,169,388	19,350,370	0
3463	Nonferrous Forgings	12,878,364	2,019,402	15,149,775	0
3465	Automotive Stampings	394,704	10,936,788	11,635,959	0
3466	Crowns & Closures	0	2,388	31,117	0
3469	Metal Stampings, nec*	1,680,923	31,797,117	36,001,327	27,165
3471	Plating & Polishing	55,575,656	25,686,313	90,428,587	2,341
3479	Metal Coating & Allied Services	34,651,671	30,134,062	74,812,903	21,190
3482	Small Arms Ammunition	573,145	7,168,594	7,939,935	61,973
3483	Ammunition, Exc. For Small Arms, nec*	0	239,855	311,988	0
3484	Small Arms	34,897	460,186	582,721	0
3489	Ordnance & Accessories, nec*	67,500	183,656	446,427	1,128
3491	Industrial Valves	57,980	3,866,723	4,341,729	0
3492	Fluid Power Valves & Hose Fittings	8,500	2,620,998	2,674,981	0
3493	Steel Springs, Except Wire	0	39,687	123,555	0
3494	Valves & Pipe Fittings, nec*	14,269,079	23,606,655	38,596,711	0
3495	Wire Springs	25,000	39,649	91,871	0
3496	Misc. Fabricated Wire Products	1,487,363	5,021,257	8,779,077	760
3497	Metal Foil & Leaf	5,978,807	8,241,623	14,467,295	820
3498	Fabricated Pipe & Fittings	202,025	3,634,947	5,219,743	0
3499	Fabricated Metal Products, nec*	4,323,607	12,621,331	25,561,096	1,576
	Multiple within SIC Code 34	31,598,570	50,045,354	100,052,011	4,658
	Invalid SIC Code within SIC Code 34	2,025,199	2,356,109	5,844,321	0
	Total for SIC Code 34	282,735,110	336,541,995	716,239,652	159,718

**Note:** **On-site Releases** from Section 5 of Form R. **On-site Waste Management** from Section 8 of Form R. **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Total Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. **Total Production-related Waste** sums Section 8 (Current Year, Column B) of Form R, except: **Non-production-related Waste** (remedial/catastrophic incidents). Facilities/forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category. One facility reported incorrectly in SIC code 3999 for 1996. The facility should have reported in SIC code 3499. The incorrectly reported amounts were as follows: 30 pounds of total releases, 3,209,773 pounds of other on-site waste management, 207,776 pounds of transfers off-site for further waste management and 3,417,119 pounds of total production-related waste.

\*nec: not elsewhere classified.



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**Table 12-2. Multiple SIC Codes, 1996: Fabricated Metals, SIC Code 34**

SIC Codes	Total Forms Number	Form As Number	Total On-site Releases Pounds	Total Off-site Releases Pounds	Total On- and Off-site Releases Pounds	Total Other On-site Waste Management Pounds	Total Transfers Off-site for Further Waste Management Pounds	Total Production-related Waste Pounds	Non-Production-related Waste Pounds
3411 3412 3479 3499	9	0	128,407	250	128,657	223,817	162,656	522,425	0
3411 3469	1	0	52,514	0	52,514	0	0	52,514	0
3411 3479	12	0	227,715	0	227,715	828,141	157,277	1,212,831	0
3412 3479	3	0	56,457	0	56,457	41,310	0	97,767	0
3412 3494	4	0	1,010	500	1,510	26,300	84,348	110,560	0
3423 3462 3471	1	0	18,246	0	18,246	0	2,390	20,636	0
3423 3471	7	0	2,728	7,979	10,707	0	49,253	59,937	0
3425 3432	3	0	16,870	108,543	125,413	0	161,454	294,014	0
3429 3441 3452 3462 3495	2	0	1,155	380	1,535	37,000	370,081	407,771	0
3429 3442 3471	8	1	19,755	31	19,786	882	928,879	945,251	0
3429 3451 3469 3471	5	5	0	0	0	0	0	0	0
3429 3469 3471	6	4	520	0	520	11,242,729	1,918,169	12,351,228	0
3429 3469 3499	1	0	2,597	0	2,597	16,772	250	19,662	0
3429 3471	22	0	193,763	5,956	199,719	309,527	1,308,726	1,834,204	0
3429 3471 3492	4	1	0	0	0	0	127,115	126,860	0
3429 3471 3497	10	0	227,406	0	227,406	733,540	99,447	1,109,631	0
3429 3499	7	0	236,795	0	236,795	28,422	10,627	295,228	0
3431 3469	4	0	356	893	1,249	45,773	10	51,360	0
3431 3469 3499	6	0	0	0	0	0	0	0	0
3432 3451 3471	4	0	11	11	22	12,375	549	7,292,887	0
3432 3471	6	0	57	27,614	27,671	0	921,000	2,298,094	0
3432 3494	4	0	41,243	0	41,243	0	689,405	4,911,130	0
3441 3442	4	0	755	6,620	7,375	0	134,122	146,531	0
3441 3442 3444 3446 3469	4	1	2,325	832	3,157	0	23,497	26,993	0
3441 3443	31	20	218,536	1,250	219,786	0	5,314	11,134	0
3441 3443 3444 3498	2	0	500	0	500	0	21,000	21,170	0
3441 3443 3449	1	0	11,088	0	11,088	0	0	11,088	0
3441 3444	1	1	0	0	0	0	0	0	0
3441 3446 3479	4	0	122,366	250	122,616	39,182	8,769	171,362	0
3441 3449	1	1	0	0	0	0	0	0	0
3441 3479	10	0	1,255	9,100	10,355	500	310,856	319,621	0
3441 3496	2	0	500	0	500	0	41,676	41,697	0
3441 3499	4	0	64,770	0	64,770	0	490	65,220	0
3442 3444 3446 3479 3499	8	0	158,969	0	158,969	140,969	87,322	473,628	0
3442 3446	1	0	0	1	1	0	25,200	25,001	0
3442 3446 3469 3471	3	0	36	86,884	86,920	0	119,553	207,394	3,600
3442 3446 3471	1	0	0	0	0	0	0	0	0
3442 3452	1	1	0	0	0	0	0	0	0
3442 3471 3499	3	0	20	0	20	30,142	62	60,352	0
3442 3490	7	0	184,373	0	184,373	0	0	157,589	0
3443 3471 3498	4	0	30	0	30	17,280	20,363	37,855	0
3443 3479	1	0	8,850	0	8,850	21,000	8,850	38,200	0
3443 3498	8	0	6,249	8,460	14,709	59,000	353,265	426,797	0
3443 3499	1	0	19,742	0	19,742	0	0	19,742	0
3444 3449	5	0	30,029	0	30,029	15,340	33,313	46,078	0
3444 3469 3499	5	0	56,691	42,243	98,934	1,665	7,719	64,206	0
3444 3471 3499	1	0	0	0	0	1,300	2,110	3,410	0
3444 3479	9	0	127,413	0	127,413	114,706	374,894	617,014	0
3444 3498	1	0	467	0	467	5,250,000	420,000	5,670,467	0
3444 3499	4	0	55,150	0	55,150	0	61,500	61,880	0
3446 3449	8	2	41,065	2,530	43,595	11,450	3,510	56,820	0
3446 3471	5	0	106,505	0	106,505	48,000	35,600	83,616	0
3449 3469	5	0	10,505	1,246	11,751	0	779,611	791,164	0
3449 3469 3479 3499	1	1	0	0	0	0	0	0	0
3449 3479	2	0	82,724	0	82,724	12,750	0	95,474	0
3449 3492 3494	2	0	0	30	30	0	537,274	537,302	0
3451 3452	2	0	0	0	0	0	18,800	18,800	0
3451 3452 3499	1	0	3,700	0	3,700	0	0	3,700	0
3451 3463	4	0	0	1,750	1,750	237,300	505	253,033	0
3451 3465 3482	1	0	12	0	12	24,488	0	24,500	0
3451 3469	1	0	14,900	0	14,900	0	1,363	16,263	0
3451 3471	7	1	1,108	4,012	5,120	0	616,341	621,194	0
3451 3471 3491 3499	2	0	8,049	0	8,049	28,292	6,305	42,641	0
3451 3471 3492	4	0	0	1,500	1,500	0	523,005	523,632	0
3451 3491	2	0	20,000	0	20,000	0	0	20,000	0

**Note:** On-site Releases from Section 5 of Form R. On-site Waste Management from Section 8 of Form R. Off-site Releases are transfers off-site to disposal from Section 6 of Form R. Total Transfers Off-site for Further Waste Management from Section 6 of Form R. Total Production-related Waste sums Section 8 of Form R, except: Non-production-related Waste (remedial/catastrophic incidents).





Table 12-2. Multiple SIC Codes, 1996: Fabricated Metals, SIC Code 34, Continued

SIC Codes	Total Forms Number	Form As Number	Total On-site Releases Pounds	Total Off-site Releases Pounds	Total On- and Off-site Releases Pounds	Total Other On-site Waste Management Pounds	Total Transfers Off-site for Further Waste Management Pounds	Total Production-related Waste Pounds	Non-Production-related Waste Pounds
3451 3492	2	0	0	0	0	0	5,315,012	5,354,043	0
3451 3492 3494	4	0	0	750	750	0	17,033,398	17,857,600	0
3451 3498	5	0	0	0	0	0	553	195,774	0
3451 3499	3	0	8,712	0	8,712	0	472,359	481,068	0
3452 3458	3	0	15	0	15	0	5,413	5,416	0
3452 3465 3479 3489	3	0	2,658	0	2,658	134,784	236,372	373,814	0
3452 3469	1	0	0	0	0	0	228,414	228,414	0
3452 3471	10	0	76,339	4,350	80,689	65,814	41,364	187,226	0
3452 3471 3479	8	2	148,682	47,098	195,780	621,373	67,743	906,538	0
3452 3479	1	0	144,000	0	144,000	0	2,900	146,900	0
3452 3496	3	3	0	0	0	0	0	0	0
3462 3463	25	2	22,717	7,440	30,157	6	1,509,550	1,714,418	0
3462 3463 3465 3482 3489	7	0	327,594	13,100	340,694	832,000	253,300	1,396,790	0
3462 3471	5	0	0	12,303	12,303	737	51,672	64,712	0
3462 3479	3	0	2,055	0	2,055	0	2,055	2,061	0
3462 3494	4	0	0	0	0	0	124,100	124,100	0
3463 3483	1	0	0	0	0	115,575	29,700	145,275	0
3463 3491 3492	3	0	12	250	262	5,261,000	454,255	5,732,135	0
3465 3469	15	0	67,783	383	68,166	54,820	1,338,800	1,472,337	130
3465 3471 3499	1	0	255	0	255	46,665	0	46,910	0
3465 3479	5	0	34,010	16,944	50,954	6,600	12,743	69,252	0
3468 3479	4	0	58,794	0	58,794	0	28,766	87,562	0
3469 3471	13	0	81,133	12,210	93,343	947,693	171,825	1,206,113	0
3469 3471 3479	2	0	17,650	0	17,650	0	433	17,833	0
3469 3471 3495	4	0	50,271	0	50,271	28,000	82,947	161,363	0
3469 3471 3499	1	0	11,627	0	11,627	9,852	53,460	73,800	0
3469 3479	7	0	71,075	4,798	75,873	278,642	25,847	379,929	0
3469 3479 3499	12	2	9,130	0	9,130	0	545,915	554,887	0
3469 3493	1	0	0	0	0	15,000	0	15,000	0
3469 3493 3495	1	0	16,730	0	16,730	0	12,000	29,000	0
3469 3493 3495 3496	1	0	500	1,841	2,341	0	10,623	12,664	0
3469 3495	3	0	17,969	6,880	24,849	0	66,883	91,479	0
3469 3496	1	0	42,700	0	42,700	20,377	7,250	32,369	0
3469 3499	6	0	36,091	0	36,091	0	5,610,717	5,641,911	0
3471 3479	96	1	339,403	605,492	944,895	2,705,799	2,036,590	5,225,551	205
3471 3479 3493 3495	2	0	935	53	988	22,000	44,000	66,993	0
3471 3479 3498	3	0	22,646	0	22,646	5,998	420	28,564	0
3471 3479 3499	10	0	31,027	2,112	33,139	121,170	112,853	267,332	0
3471 3484 3499	1	1	0	0	0	0	0	0	0
3471 3490	2	0	255	0	255	78	20	156	0
3471 3491 3494	3	0	5	252	257	0	219,005	219,500	0
3471 3496	6	0	0	1,462	1,462	9,400	4,036	13,892	0
3471 3496 3499	4	0	11,155	13,705	24,860	21,000	500	45,648	0
3471 3497	3	0	255	0	255	18,188	3,683	21,933	0
3471 3499	14	2	62,113	4,229	66,342	89,395	372,317	572,672	0
3474 3479	15	0	39,839	2,593	42,432	371,522	106,325	520,053	723
3479 3494 3498	2	0	1	72	73	0	27,115	27,272	0
3479 3496 3499	2	0	2,996	0	2,996	36,220	6,370	46,178	0
3479 3498	2	0	986	168,700	169,686	0	811,034	980,720	0
3479 3499	14	3	47,982	1,728	49,710	78,910	9,743	141,919	0
3482 3483	3	0	56,900	0	56,900	0	40,800	97,700	0
3482 3489	4	4	0	0	0	0	0	0	0
3489 3499	1	1	0	0	0	0	0	0	0
3490 3499	7	0	91,170	1,014	92,184	80,000	125,596	297,335	0
3491 3494	14	0	20	2,682	2,702	0	592,655	595,596	0
3493 3495	3	0	26,810	500	27,310	0	82,600	109,420	0
3493 3495 3496	2	0	30,604	0	30,604	0	7,007	37,611	0
3494 3479	1	0	37	11,138	11,175	0	72,491	75,663	0
3496 3499	3	2	25,052	25,047	50,099	0	0	25,052	0
Total for SIC Code 34	688	62	4,624,980	1,287,991	5,912,971	31,598,570	50,045,354	100,052,011	4,658

**Note:** On-site Releases from Section 5 of Form R. On-site Waste Management from Section 8 of Form R. Off-site Releases are transfers off-site to disposal from Section 6 of Form R. Total Transfers Off-site for Further Waste Management from Section 6 of Form R. Total Production-related Waste sums Section 8 of Form R, except: Non-production-related Waste (remedial/catastrophic incidents).



## Chapter 12 — TRI Data for Fabricated Metals

combination of screw machine products (SIC code 3451), fluid power valves and hose fittings (SIC code 3492), and miscellaneous valves and pipe fittings (SIC code 3494) reported the largest total production-related waste (17.9 million pounds).

### On- and Off-site Releases

Air emissions of 69.2 million pounds accounted for three-fourths (76.7%) of the fabricated metal sector's reporting of total on- and off-site releases in 1996. Most of the remainder (22.1%) was

reported as off-site releases (transfers to disposal), which totaled 19.9 million pounds. Other types of releases amounted to less than 1% each of the sector's total on- and off-site releases.

Table 12-3 presents the sector's reporting of on- and off-site releases in 1996, and Figure 12-1 illustrates their distribution by type of release.

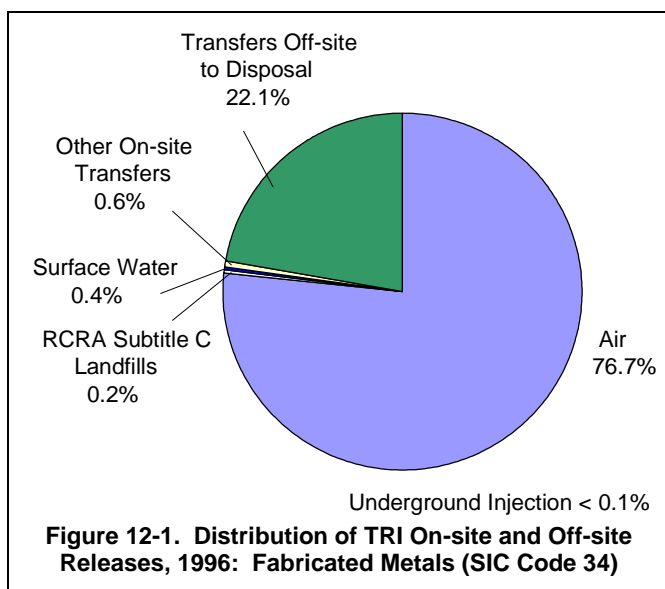
The metal cans industry (SIC code 3411) reported 24.7 million pounds of air emissions (35.7% of the sector's total), including 11.6 million pounds of

**Table 12-3. TRI On-site and Off-site Releases, 1996: Fabricated Metals, SIC Code 34 (in Rank Order)**

SIC Code	Industry	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection		On-site Land Releases		Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
				Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds			
3411	Metal Cans	24,734,781	5	0	7	0	19	24,734,812	59,341	24,794,153
3479	Metal Coating & Allied Services	8,362,159	31,510	0	0	250	65,299	8,459,218	3,094,957	11,554,175
3469	Metal Stampings, nec*	2,449,391	1,344	0	0	0	697	2,451,432	8,254,646	10,706,078
3471	Plating & Polishing	3,663,224	254,456	0	0	147,914	36,412	4,102,006	2,739,869	6,841,875
	Multiple within SIC Code 34	4,453,568	22,701	0	0	10,959	137,752	4,624,980	1,287,991	5,912,971
3499	Fabricated Metal Products, nec*	5,448,732	2,411	0	0	8,891	7,668	5,467,702	323,144	5,790,846
3442	Metal Doors, Sash, & Trim	2,282,988	0	0	0	0	772	2,283,760	1,380	2,285,140
3412	Metal Barrels, Drums, & Pails	2,268,519	0	0	0	0	6,252	2,274,771	0	2,274,771
3462	Iron & Steel Forgings	672,111	3,038	0	0	0	27,055	702,204	1,256,282	1,958,486
3429	Hardware, nec*	1,239,849	2,509	563	0	0	0	1,242,921	632,806	1,875,727
3441	Fabricated Structural Metal	1,587,099	2,299	0	0	7,500	85,826	1,682,724	141,818	1,824,542
	Invalid SIC Code within SIC Code 34	1,589,643	169	0	0	0	0	1,589,812	50,435	1,640,247
3444	Sheet Metal Work	1,573,852	4	0	0	0	3,727	1,577,583	52,417	1,630,000
3496	Misc. Fabricated Wire Products	884,031	4,093	0	0	0	434	888,558	699,516	1,588,074
3443	Fabricated Plate Work (Boiler Shops)	1,404,833	2,706	0	0	5	16,782	1,424,326	92,391	1,516,717
3448	Prefabricated Metal Buildings	1,040,811	5	0	0	0	14,600	1,055,416	101,243	1,156,659
3498	Fabricated Pipe & Fittings	641,696	4,045	0	0	0	97,784	743,525	95,250	838,775
3421	Cutlery	720,701	0	0	0	0	250	720,956	83,229	804,185
3497	Metal Foil & Leaf	365,164	550	0	0	0	66,300	432,014	40,523	472,537
3452	Bolts, Nuts, Rivets, & Washers	373,150	83	0	0	0	0	373,233	81,970	455,203
3451	Screw Machine Products	423,035	770	0	0	10	500	424,315	5,259	429,574
3491	Industrial Valves	397,154	271	0	0	5	255	397,685	19,568	417,253
3423	Hand & Edge Tools, nec*	366,887	280	0	0	0	20	367,187	43,042	410,229
3449	Miscellaneous Metal Work	404,639	0	0	0	0	0	404,639	270	404,909
3494	Valves & Pipe Fittings, nec*	246,715	657	0	0	27,622	765	275,759	63,222	338,981
3446	Architectural Metal Work	228,778	86	0	0	0	0	228,864	108,861	337,725
3433	Heating Equipment, Except Electric	328,585	11	0	0	5	0	328,601	2,009	330,610
3482	Small Arms Ammunition	91,513	15,364	0	0	0	0	106,877	222,280	329,157
3465	Automotive Stampings	272,544	84	0	0	420	870	273,918	15,616	289,534
3489	Ordnance & Accessories, nec*	196,076	7	0	0	0	0	196,083	66	196,149
3431	Metal Sanitary Ware	55,895	10	0	0	0	2,555	58,460	127,650	186,110
3432	Plumbing Fixture Fittings & Trim	68,509	1,592	0	0	750	0	70,851	69,729	140,580
3463	Nonferrous Forgings	71,109	6	0	0	0	15	71,130	44,077	115,207
3484	Small Arms	46,704	5	0	0	0	0	46,709	39,569	86,278
3493	Steel Springs, Except Wire	77,500	4	0	0	0	0	77,504	4,968	82,472
3483	Ammunition, Exc. For Small Arms, nec*	69,364	0	0	0	0	0	69,364	0	69,364
3425	Saw Blades & Handsaws	7,057	0	0	0	0	0	7,057	60,330	67,387
3492	Fluid Power Valves & Hose Fittings	42,041	0	0	0	0	0	42,041	5,805	47,846
3466	Crowns & Closures	28,867	0	0	0	0	0	28,867	0	28,867
3495	Wire Springs	12,602	0	0	0	0	0	12,602	12,372	24,974
	Total for SIC Code 34	69,191,876	351,080	563	7	204,331	572,609	70,320,466	19,933,901	90,254,367

**Note:** On-site Releases from Section 5 of Form R. Off-site Releases from Section 6 (off-site transfers to disposal) of Form R. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category.

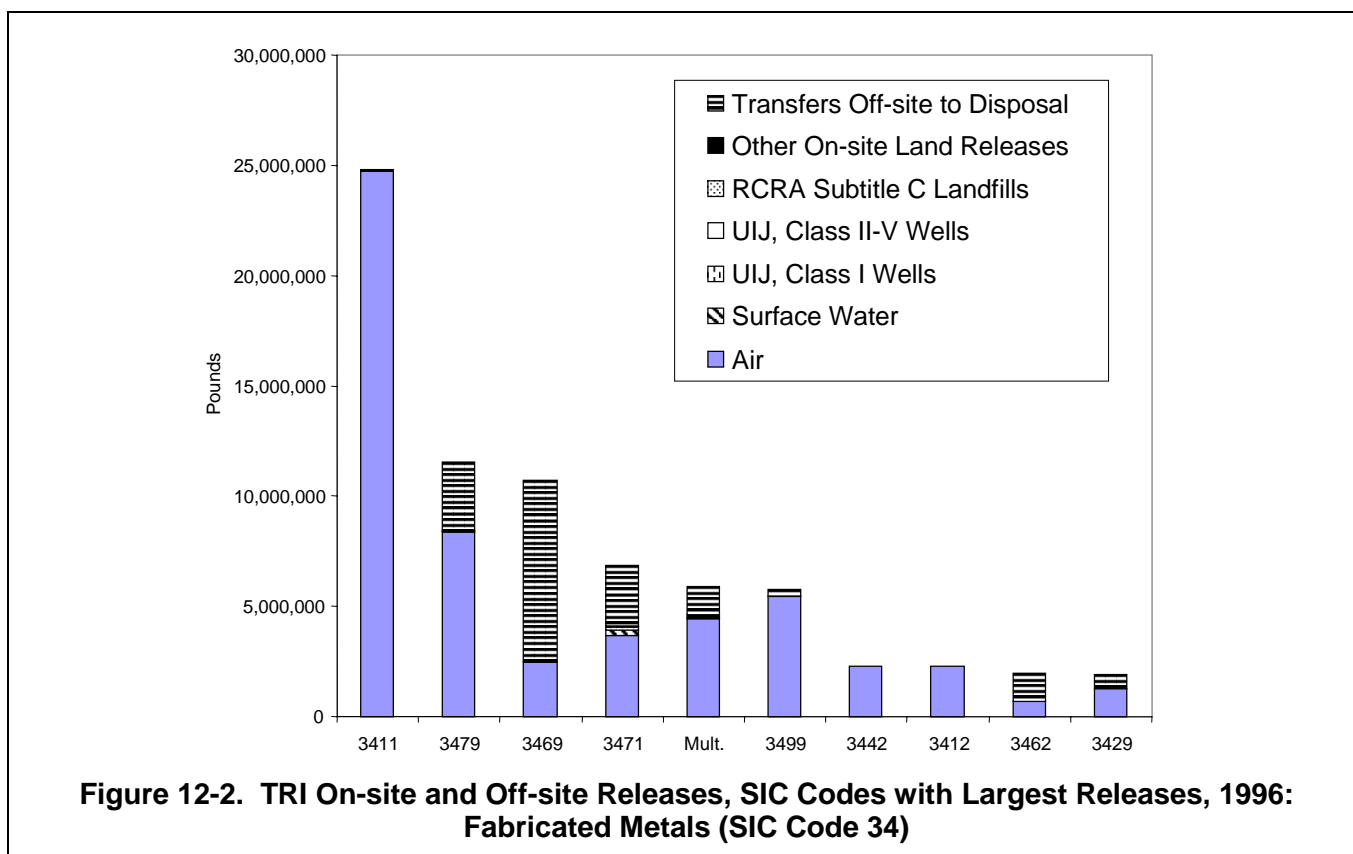
\*nec: not elsewhere classified.



**Note:** On-site Releases from Section 5 of Form R. Off-site Releases from Section 6 (transfers off-site to disposal) of Form R.

glycol ethers. The miscellaneous metal stampings industry (SIC code 3469) reported 8.3 million pounds of off-site releases (transfers to disposal). This amount was 41.4% of the sector's total off-site releases. One facility in SIC code 3469 reported off-site releases of 8.0 million pounds of aluminum oxide. The metal coating industry (SIC code 3479) ranked second for both air emissions (8.4 million pounds, or 12.1%) and off-site releases (3.1 million pounds of transfers to disposal, or 15.5%). Miscellaneous fabricated metal products (SIC code 3499) ranked third for air emissions with 5.4 million pounds (7.9%), and the plating and polishing industry (SIC code 3471) ranked third for off-site releases with 2.7 million pounds (13.7%).

Figure 12-2 shows the distribution of on- and off-site releases for the industries (four-digit SIC code) with the sector's largest releases.



**Note:** On-site Releases from Section 5 of Form R. Off-site Releases from Section 6 (transfers off-site to disposal). UIJ = underground injection. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category.



## Other On-site Waste Management

As shown in Table 12-4, the fabricated metals sector reported 148.0 million pounds of on-site recycling in 1996, half (52.4%) of the sector's other on-site waste management. The sector also reported 113.7 million pounds of on-site treatment

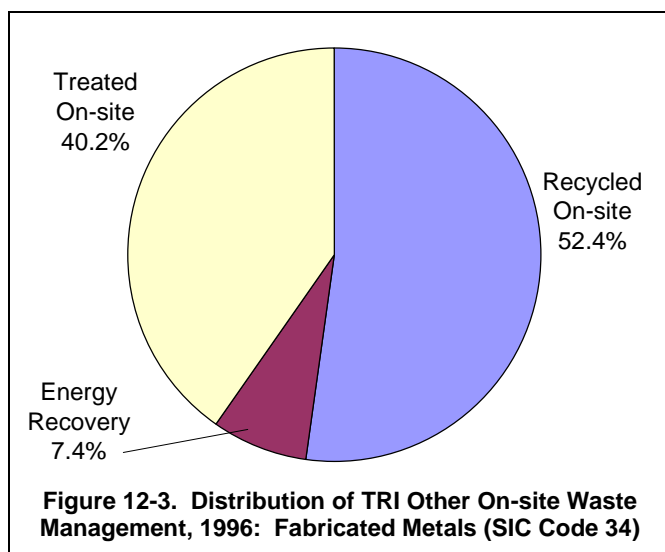
(40.2% of the total other on-site waste management). On-site energy recovery totaled 21.0 million pounds (7.4%). Figure 12-3 illustrates the percentage distribution of on-site waste management methods, as reported by the fabricated metals sector.

**Table 12-4. TRI Other On-site Waste Management, 1996: Fabricated Metals, SIC Code 34 (in Rank Order)**

SIC Code	Industry	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Total Other On-site Waste Management Pounds
3471	Plating & Polishing	20,459,311	13,266	35,103,079	55,575,656
3421	Cutlery	46,457,548	0	36,544	46,494,092
3411	Metal Cans	258,637	6,163,803	29,244,843	35,667,283
3479	Metal Coating & Allied Services	1,245,002	9,999,980	23,406,689	34,651,671
	Multiple within SIC Code 34	23,291,102	522,460	7,785,008	31,598,570
3494	Valves & Pipe Fittings, nec*	14,223,712	0	45,367	14,269,079
3463	Nonferrous Forgings	12,789,900	0	88,464	12,878,364
3432	Plumbing Fixture Fittings & Trim	8,769,918	0	168,747	8,938,665
3429	Hardware, nec*	6,289,366	29,981	1,094,975	7,414,322
3448	Prefabricated Metal Buildings	6,208,600	0	287,118	6,495,718
3497	Metal Foil & Leaf	539,848	0	5,438,959	5,978,807
3499	Fabricated Metal Products, nec*	2,211,011	0	2,112,596	4,323,607
3452	Bolts, Nuts, Rivets, & Washers	28,450	2,100,000	858,092	2,986,542
	Invalid SIC Code within SIC Code 34	586,283	468,800	970,116	2,025,199
3462	Iron & Steel Forgings	1,808,995	0	116,304	1,925,299
3469	Metal Stampings, nec*	993,999	2,091	684,833	1,680,923
3412	Metal Barrels, Drums, & Pails	87,895	1,247,496	328,535	1,663,926
3496	Misc. Fabricated Wire Products	283,909	0	1,203,454	1,487,363
3443	Fabricated Plate Work (Boiler Shops)	5,105	0	1,410,471	1,415,576
3431	Metal Sanitary Ware	942,805	0	77,000	1,019,805
3423	Hand & Edge Tools, nec*	403	0	895,907	896,310
3444	Sheet Metal Work	68,155	335,100	491,690	894,945
3482	Small Arms Ammunition	500	0	572,645	573,145
3451	Screw Machine Products	135,700	94,003	224,971	454,674
3465	Automotive Stampings	16,848	0	377,856	394,704
3449	Miscellaneous Metal Work	168,070	0	123,262	291,332
3498	Fabricated Pipe & Fittings	8,000	0	194,025	202,025
3446	Architectural Metal Work	14,168	0	166,228	180,396
3441	Fabricated Structural Metal	64,522	0	31,811	96,333
3489	Ordinance & Accessories, nec*	1,000	0	66,500	67,500
3442	Metal Doors, Sash, & Trim	36,070	0	28,368	64,438
3491	Industrial Valves	7,980	0	50,000	57,980
3484	Small Arms	0	0	34,897	34,897
3495	Wire Springs	25,000	0	0	25,000
3492	Fluid Power Valves & Hose Fittings	600	0	7,900	8,500
3433	Heating Equipment, Except Electric	2,464	0	0	2,464
3425	Saw Blades & Handsaws	0	0	0	0
3466	Crowns & Closures	0	0	0	0
3483	Ammunition, Exc. For Small Arms, nec*	0	0	0	0
3493	Steel Springs, Except Wire	0	0	0	0
Total for SIC Code 34		148,030,876	20,976,980	113,727,254	282,735,110

**Note:** Other On-site Waste Management from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category. One facility reported incorrectly in SIC code 3999 for 1996. The facility should have reported in SIC code 3499. The incorrectly reported amount was 3,209,773 pounds of other on-site waste management. The rank for other on-site waste management for SIC code 3499 changes from 12 to 9.

\*nec: not elsewhere classified.



Note: Data from Section 8 of Form R.

The cutlery industry (SIC code 3421) ranked first in this sector for on-site recycling, with 46.5 million pounds (31.4% of the sector's total). Almost all of this amount was recycling of trichloroethylene (46.5 million pounds), including 40.5 million pounds reported by one facility. Ranking second for on-site recycling, the multiple-codes group in SIC code 34 reported 23.3 million pounds (15.7%). The plating and polishing industry (SIC code 3471) ranked third with 20.5 million pounds (13.8%).

The plating and polishing industry (SIC code 3471) accounted for 30.9% of the sector's on-site treatment, reporting 35.1 million pounds. This included on-site treatment of 15.8 million pounds of nitric acid. The metal cans industry (SIC code 3411) ranked second with 29.2 million pounds (25.7%) of on-site treatment, and the metal coating industry (SIC code 3479) ranked third with 23.4 million pounds (20.6%).

The metal coating industry (SIC code 3479) reported the sector's largest on-site energy recovery: 10.0 million pounds, or 47.7% of the total. The metal cans industry (SIC code 3411) ranked second with 6.2 million pounds (29.4%), and the bolts, nuts, rivets, and washers industry

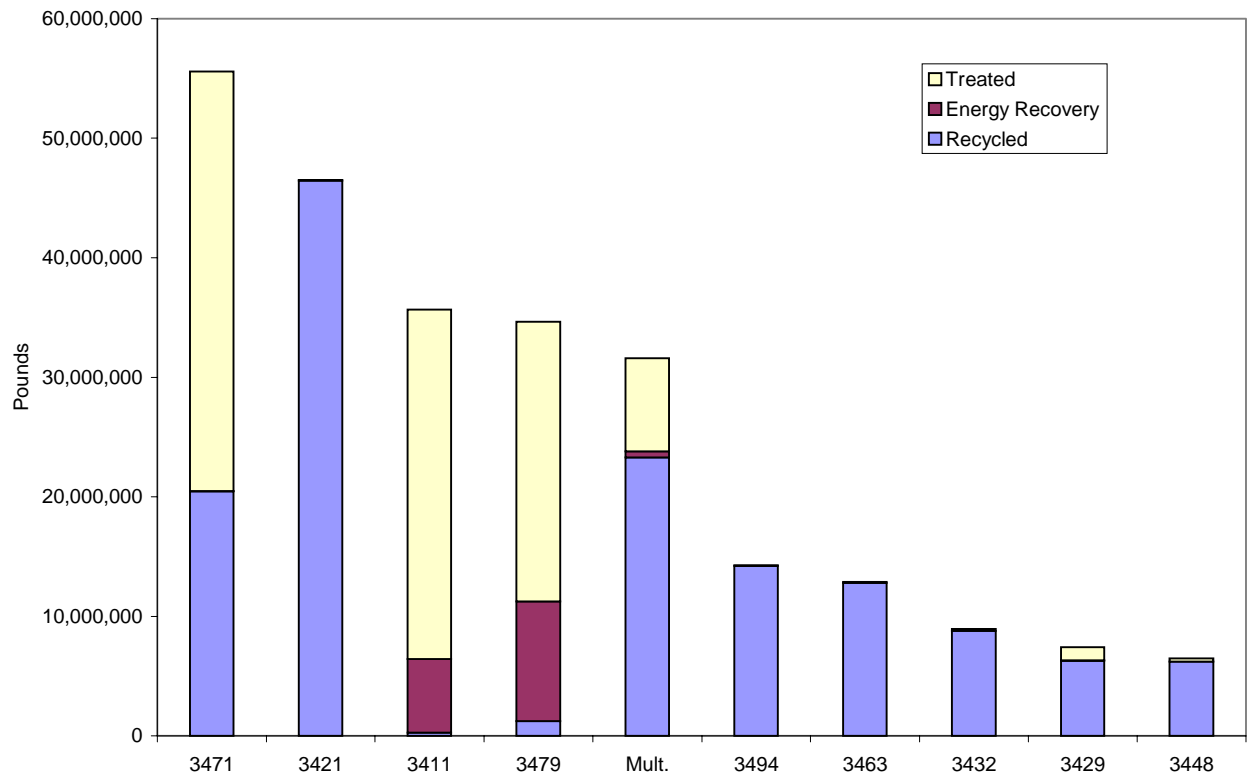
(SIC code 3452) ranked third with 2.1 million pounds (10.0%).

Figure 12-4 illustrates the distribution of on-site waste management reporting for the top industries in this sector.

## Transfers Off-site for Further Waste Management

In 1996, the fabricated metals sector reported more than 90% of its transfers off-site for further waste management as transfers off-site to recycling. The sector reported 303.4 million pounds of transfers to recycling. Other types of transfers represented less than 5% each of the sector's total transfers off-site for further waste management. These were 13.7 million pounds of transfers to energy recovery, 12.7 million pounds of transfers to treatment, and 6.6 million pounds of transfers to POTWs. The sector's reported amounts of transfers off-site for further waste management in 1996 appears in Table 12-5. Figure 12-5 illustrates the percentage distribution of these transfers by type.

Multiple-codes forms in SIC code 34 ranked first in the fabricated metals sector for reporting of transfers to recycling, with 47.2 million pounds, which was 15.6% of the sector's total. This amount included 26.4 million pounds of copper. One multiple-codes facility (reporting SIC codes 3451, 3492, and 3494) reported transferring 12.7 million pounds of copper off-site to recycling. Ranking second, the plumbing fixture fittings and trim industry (SIC code 3432) reported 41.3 million pounds (13.6%). This industry reported transfers to recycling of 17.8 million pounds of copper and 14.7 million pounds of copper compounds. One facility in SIC code 3432 reported transfers of 9.8 million pounds of copper to recycling. Another facility in this industry reported transfers of 12.3 million pounds of copper compounds to recycling. The



**Figure 12-4. TRI Other On-site Waste Management, SIC Codes with Largest Totals, 1996: Fabricated Metals (SIC Code 34)**

**Note:** Other On-site Waste Management from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the “multiple” category. One facility reported incorrectly in SIC code 3999 for 1996. The facility should have reported in SIC code 3499. The incorrectly reported amount was 3,209,773 pounds of other on-site waste management. The rank for other on-site waste management for SIC code 3499 changes from 12 to 9.

miscellaneous metal stampings industry (SIC code 3469) ranked third for transfers to recycling, reporting 30.7 million pounds (10.1%).

Two industries reported approximately one-third each of the sector’s transfers to energy recovery. The metal cans industry (SIC code 3411) reported 4.5 million pounds (32.5%), and the metal coating industry (SIC code 3479) reported 4.3 million pounds (31.3%). The third-ranked industry for transfers to energy recovery was metal barrels, drums, and pails (SIC code 3412), with 979,000 pounds (7.1%).

The plating and polishing industry (SIC code 3471) reported 4.6 million pounds of transfers to

treatment, 36.3% of the sector’s 1996 total in this category. The metal coating industry (SIC code 3479) ranked second with 2.1 million pounds (16.8%), and the multiple-codes group ranked third with 1.5 million pounds (11.5%). The same three industry groups reported the sector’s largest transfers to POTWs: plating and polishing with 2.1 million pounds (31.5%), metal coating with 1.7 million pounds (25.5%), and multiple-codes forms with 736,000 pounds (11.2%).

Figure 12-6 illustrates the distribution of off-site transfers for further waste management for the top industries in this sector.

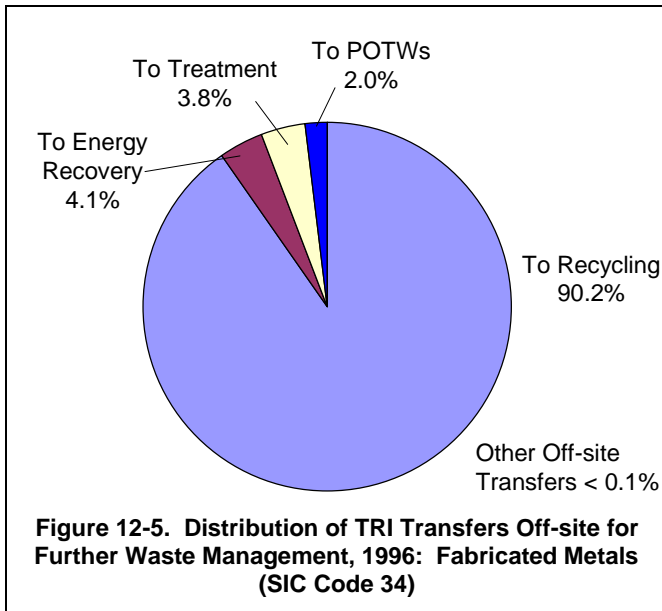


Table 12-5. TRI Transfers Off-site for Further Waste Management, 1996: Fabricated Metals, SIC Code 34 (in Rank Order)

SIC Code	Industry	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds	Other Off-site Transfers Pounds	Total Off-site Transfers for Further Waste Management Pounds
	Multiple within SIC Code 34	47,221,144	615,413	1,453,163	735,732	19,902	50,045,354
3432	Plumbing Fixture Fittings & Trim	41,274,389	5,949	204,871	7,167	5	41,492,381
3469	Metal Stampings, nec*	30,748,969	352,175	194,262	496,259	5,452	31,797,117
3479	Metal Coating & Allied Services	22,021,698	4,303,215	2,128,630	1,680,519	0	30,134,062
3471	Plating & Polishing	18,587,147	418,791	4,600,560	2,079,565	250	25,686,313
3494	Valves & Pipe Fittings, nec*	23,507,538	8,683	69,197	21,237	0	23,606,655
3451	Screw Machine Products	17,710,495	17,194	64,610	41,419	0	17,833,718
3462	Iron & Steel Forgings	15,964,855	32,785	158,173	13,575	0	16,169,388
3499	Fabricated Metal Products, nec*	11,315,170	257,452	739,282	309,427	0	12,621,331
3465	Automotive Stampings	10,743,633	62,147	49,906	81,102	0	10,936,788
3411	Metal Cans	6,045,016	4,455,356	308,355	1,982	13,800	10,824,509
3429	Hardware, nec*	9,533,569	7,370	122,281	125,865	0	9,789,085
3497	Metal Foil & Leaf	6,902,837	855,826	461,935	3,625	17,400	8,241,623
3441	Fabricated Structural Metal	7,105,567	282,509	99,094	29,297	0	7,516,467
3482	Small Arms Ammunition	7,068,030	10,176	82,660	7,728	0	7,168,594
3496	Misc. Fabricated Wire Products	4,433,511	17,829	554,471	15,446	0	5,021,257
3443	Fabricated Plate Work (Boiler Shops)	4,525,659	43,886	159,186	37,751	31,482	4,797,964
3491	Industrial Valves	3,854,842	1,001	2,525	8,355	0	3,866,723
3498	Fabricated Pipe & Fittings	3,562,584	255	71,544	564	0	3,634,947
3492	Fluid Power Valves & Hose Fittings	2,588,247	6,702	1,143	24,906	0	2,620,998
	Invalid SIC Code within SIC Code 34	1,727,460	327,042	301,250	357	0	2,356,109
3463	Nonferrous Forgings	1,628,596	459	331,012	59,335	0	2,019,402
3412	Metal Barrels, Drums, & Pails	181,164	979,127	19,549	155,410	0	1,335,250
3452	Bolts, Nuts, Rivets, & Washers	740,302	19,047	32,087	396,135	0	1,187,571
3444	Sheet Metal Work	791,565	76,158	97,337	99,283	5	1,064,348
3433	Heating Equipment, Except Electric	524,113	147,482	14,284	774	0	686,653
3423	Hand & Edge Tools, nec*	590,467	3,220	67,074	17,712	0	678,473
3484	Small Arms	408,092	12,279	39,496	319	0	460,186
3442	Metal Doors, Sash, & Trim	116,223	271,698	50,674	19,620	0	458,215
3421	Cutlery	424,802	0	10,845	22,066	0	457,713
3446	Architectural Metal Work	384,716	2,177	35,475	15	0	422,383
3431	Metal Sanitary Ware	358,251	0	53,091	22	0	411,364
3425	Saw Blades & Handsaws	119,133	0	75,286	104,094	0	298,513
3483	Ammunition, Exc. For Small Arms, nec*	237,555	1,095	1,205	0	0	239,855
3449	Miscellaneous Metal Work	221,576	7,832	3,900	6	0	233,314
3489	Ordinance & Accessories, nec*	80,100	97,853	5,630	73	0	183,656
3448	Prefabricated Metal Buildings	126,109	21,152	13,726	755	250	161,992
3493	Steel Springs, Except Wire	39,687	0	0	0	0	39,687
3495	Wire Springs	34,287	5,337	0	25	0	39,649
3466	Crowns & Closures	0	2,388	0	0	0	2,388
	Total for SIC Code 34	303,449,098	13,729,060	12,677,769	6,597,522	88,546	336,541,995

**Note:** Off-site Transfers for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category.

\*nec: not elsewhere classified.



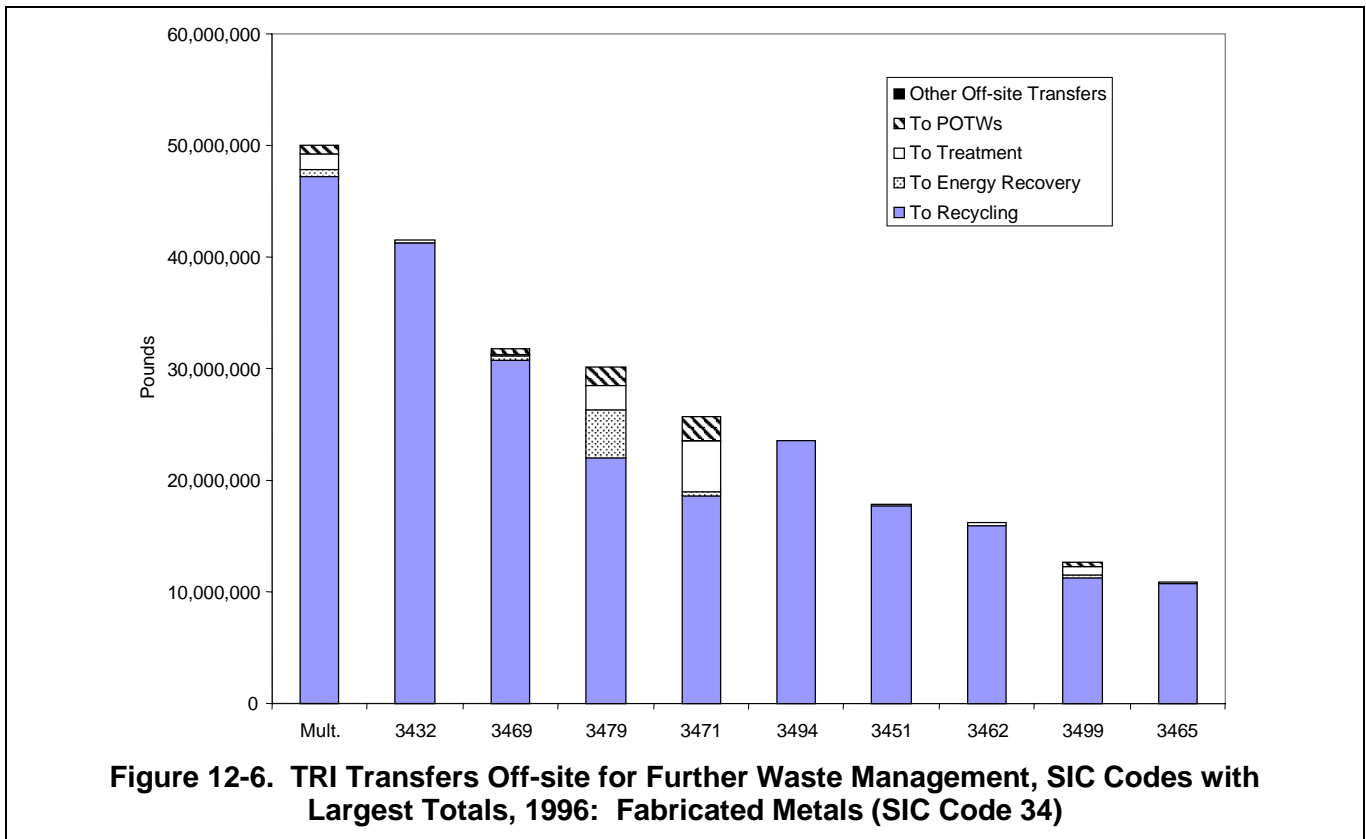
**Figure 12-5. Distribution of TRI Transfers Off-site for Further Waste Management, 1996: Fabricated Metals (SIC Code 34)**

**Note:** Transfers Off-site for Further Waste Management from Section 6 (excluding transfers off-site to disposal) of Form R. Other Off-site transfers are transfers reported without a valid waste management code.

## 1996 TRI Data by State for Fabricated Metals

Table 12-6 presents 1996 summary TRI data by state for the fabricated metals sector. Facilities in the fabricated metals sector are found throughout the United States. The sector submitted 683 forms in Illinois and 671 forms in Ohio. These numbers represented approximately 9% each of the sector's total of 7,416 forms. The sector submitted 485 forms in Pennsylvania, 465 forms in California, and 447 forms in Michigan, each about 6% of the total.

Illinois ranked first for on-site releases by the fabricated metals sector in 1996. Illinois' on-site releases totaled 6.4 million pounds, or 9.1% of the



**Figure 12-6. TRI Transfers Off-site for Further Waste Management, SIC Codes with Largest Totals, 1996: Fabricated Metals (SIC Code 34)**

**Note:** Off-site Transfers for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category.





sector's total. Ohio reported the second-largest on-site releases, with 5.9 million pounds (8.4%), Indiana ranked third with 4.0 million pounds (5.7%).

Wisconsin reported the sector's largest off-site releases (8.3 million pounds, or 41.6% of the sector's total) and the largest total on- and off-site releases (11.0 million pounds, or 12.2%). Texas ranked second for off-site releases, with 1.6

**Table 12-6. Summary of TRI Information by State, 1996: Fabricated Metals, SIC Code 34**

State	Total Facilities Number	Total Forms Number	Form As Number	Total On-site Releases Pounds	Total Off-site Releases Pounds	Total On- and Off-site Releases Pounds	Total Other On-site Waste Management Pounds	Total Transfers Off-site for Further Waste Management Pounds	Total Production-related Waste Pounds	Non-Production-related Waste Pounds
Alabama	63	167	7	2,588,559	123,813	2,712,372	7,731,805	6,819,872	17,361,405	0
Arizona	24	45	1	231,787	452	232,239	4,830,451	4,188,378	9,289,793	0
Arkansas	40	131	17	781,135	351,952	1,133,087	2,350,466	4,971,081	8,705,157	0
California	191	465	33	3,060,608	419,582	3,480,190	16,491,688	10,151,580	32,616,108	520
Colorado	20	50	4	1,033,497	558,985	1,592,482	879,317	9,594,205	11,525,219	0
Connecticut	88	221	5	1,154,205	211,254	1,365,459	2,649,897	8,414,798	12,541,376	211
Delaware	1	1	0	0	500	500	3,000	2,500	5,830	0
Florida	53	114	26	1,774,079	7,568	1,781,647	1,520,546	4,813,416	8,045,211	2,126
Georgia	44	118	14	1,472,345	59,449	1,531,794	3,800,952	3,189,672	8,596,585	500
Hawaii	1	5	0	137,142	71	137,213	67,357	41,548	246,119	126
Idaho	5	14	0	1,127	19,017	20,144	449,980	412,860	855,627	27,300
Illinois	261	683	46	6,406,711	1,329,550	7,736,261	27,120,565	17,963,064	54,227,591	28,270
Indiana	147	383	21	3,983,506	648,994	4,632,500	23,996,072	41,797,469	71,928,698	4,985
Iowa	43	109	4	1,231,512	71,794	1,303,306	10,763,146	4,212,001	16,328,222	0
Kansas	32	70	3	1,057,353	118,568	1,175,921	725,535	1,124,718	3,560,908	820
Kentucky	49	132	7	798,804	309,866	1,108,670	961,120	1,994,131	3,780,774	110
Louisiana	24	66	9	655,822	147,230	803,052	467,762	1,552,362	2,838,102	0
Maine	8	25	4	41,247	7,700	48,947	30,573	450,094	528,323	0
Maryland	17	54	12	597,444	64,129	661,573	913,348	1,394,609	2,961,219	0
Massachusetts	81	195	8	761,589	82,999	844,588	3,161,077	3,817,798	7,788,132	382
Michigan	176	447	24	2,102,759	325,550	2,428,309	11,497,321	32,826,108	51,969,052	1
Minnesota	77	157	3	2,337,399	29,941	2,367,340	2,117,078	3,437,166	8,239,230	2
Mississippi	40	127	11	1,783,871	185,861	1,969,732	5,074,299	3,586,912	10,598,761	0
Missouri	64	210	17	2,357,698	384,347	2,742,045	6,681,472	9,370,987	18,534,894	34,673
Montana	1	1	1	0	0	0	0	0	0	0
Nebraska	16	46	0	698,281	104,738	803,019	781,703	730,158	2,190,662	0
Nevada	4	6	0	20,328	21,082	41,410	0	892,017	914,996	0
New Hampshire	13	34	16	90,535	25,333	115,868	482,120	4,383,995	4,987,826	0
New Jersey	68	180	5	1,578,183	59,296	1,637,479	5,904,740	5,058,928	12,363,726	743
New Mexico	2	2	0	11,505	250	11,755	0	250	11,960	0
New York	87	194	15	2,362,424	401,261	2,763,685	6,829,805	10,428,716	20,180,401	54
North Carolina	53	138	14	1,749,408	98,532	1,847,940	14,952,079	19,950,708	35,768,639	15
Ohio	269	671	49	5,938,733	1,466,023	7,404,756	18,505,482	26,109,424	51,974,070	15
Oklahoma	52	143	21	1,046,954	604,941	1,651,895	5,413,470	6,626,296	13,318,396	0
Oregon	24	46	3	252,797	13,488	266,285	858,287	909,273	2,051,941	0
Pennsylvania	169	485	16	3,243,480	744,673	3,988,153	13,989,286	27,217,457	42,470,851	1,943
Puerto Rico	10	32	0	283,818	695	284,513	234,237	709,221	1,229,278	750
Rhode Island	27	66	6	190,820	114,389	305,209	750,914	2,045,683	3,098,995	200
South Carolina	49	122	10	1,133,563	39,444	1,173,007	2,646,794	9,465,880	13,642,394	0
South Dakota	9	10	2	135,355	1,400	136,755	0	26,221	162,776	60
Tennessee	74	197	6	3,066,866	256,427	3,323,293	4,323,792	5,434,659	13,150,343	65
Texas	152	344	23	3,248,523	1,602,456	4,850,979	5,041,862	16,816,606	34,150,793	21,672
Utah	20	65	30	492,577	6,410	498,987	6,216	359,545	1,000,598	0
Vermont	1	2	0	15,692	0	15,692	0	20,543	36,235	0
Virginia	38	94	17	1,817,940	49,814	1,867,754	56,209,254	3,099,912	61,455,119	805
Washington	30	72	1	1,290,287	560,239	1,850,526	404,601	1,501,500	3,535,977	10
West Virginia	19	75	2	2,334,433	13,951	2,348,384	1,974,837	977,890	5,317,171	0
Wisconsin	146	398	8	2,754,773	8,289,637	11,044,410	9,106,804	17,648,289	29,905,019	33,360
Wyoming	1	4	0	212,992	250	213,242	34,000	1,495	249,150	0
Total for SIC Code 34	2,883	7,416	521	70,320,466	19,933,901	90,254,367	282,735,110	336,541,995	716,239,652	159,718

**Note:** On-site Releases from Section 5 of Form R. On-site Waste Management from Section 8 of Form R. Off-site Releases from Section 6 (transfers off-site to disposal) of Form R. Total Transfers Off-site for Further Waste Management from Section 6 (excluding transfers off-site to disposal) of Form R. Total Production-related Waste sums Section 8 (Current Year, Column B) of Form R, except: Non-production-related Waste (remedial/catastrophic incidents). One facility in Colorado reported incorrectly in SIC code 39 for 1996. The facility should have reported in SIC code 34. The incorrectly reported amounts were as follows: 30 pounds of total releases, 3,209,773 pounds of other on-site waste management, 207,776 pounds of transfers off-site for further waste management and 3,417,119 pounds of total production-related waste.



million pounds (8.0%). Ohio was third with 1.5 million pounds (7.4%). For total on- and off-site releases, Illinois ranked second with 7.7 million pounds (8.6%), while Ohio ranked third with 7.4 million pounds (8.2%).

Virginia was the state with the largest other on-site waste management reported by the fabricated metals sector, with 56.2 million pounds, or 19.9% of the sector's total other on-site waste management. Ranking second, Illinois forms reported 27.1 million pounds (9.6%). Indiana followed with 24.0 million pounds (8.5%).

The fabricated metals sector reported 41.8 million pounds of transfers off-site for further waste management in Indiana, which was 12.4% of the sector's total. Michigan had 32.8 million pounds (9.8%) and Pennsylvania 27.2 million pounds (8.1%) of transfers off-site for further waste management.

Indiana ranked first for total production-related waste reported by the fabricated metals sector with 71.9 million pounds (10.0%), followed by Virginia with 61.5 million pounds (8.6%) and Illinois with 54.2 million pounds (7.6%).

Map 12-1 illustrates the geographic distribution of total on- and off-site releases in the fabricated metals sector.

## **1996 TRI Data by Chemical for Fabricated Metals**

The top 15 chemicals and chemical categories for total on- and off-site releases reported by the fabricated metals sector in 1996 appear in Table 12-7. Releases of these chemicals totaled 78.7 million pounds, or 87.1% of all releases reported by the sector. Air emissions of 62.8 million pounds of these chemicals accounted for 90.8% of the sector's total air emissions. The sector also reported 15.4 million pounds of off-site releases

(transfers to disposal) of these chemicals, which was 77.3% of the sector's total reporting in that category. Air emissions represented 98% or more of the total on- and off-site releases of 11 of the top 15 chemicals. The majority of releases for the remaining four chemicals were reported as off-site releases (transfers to disposal).

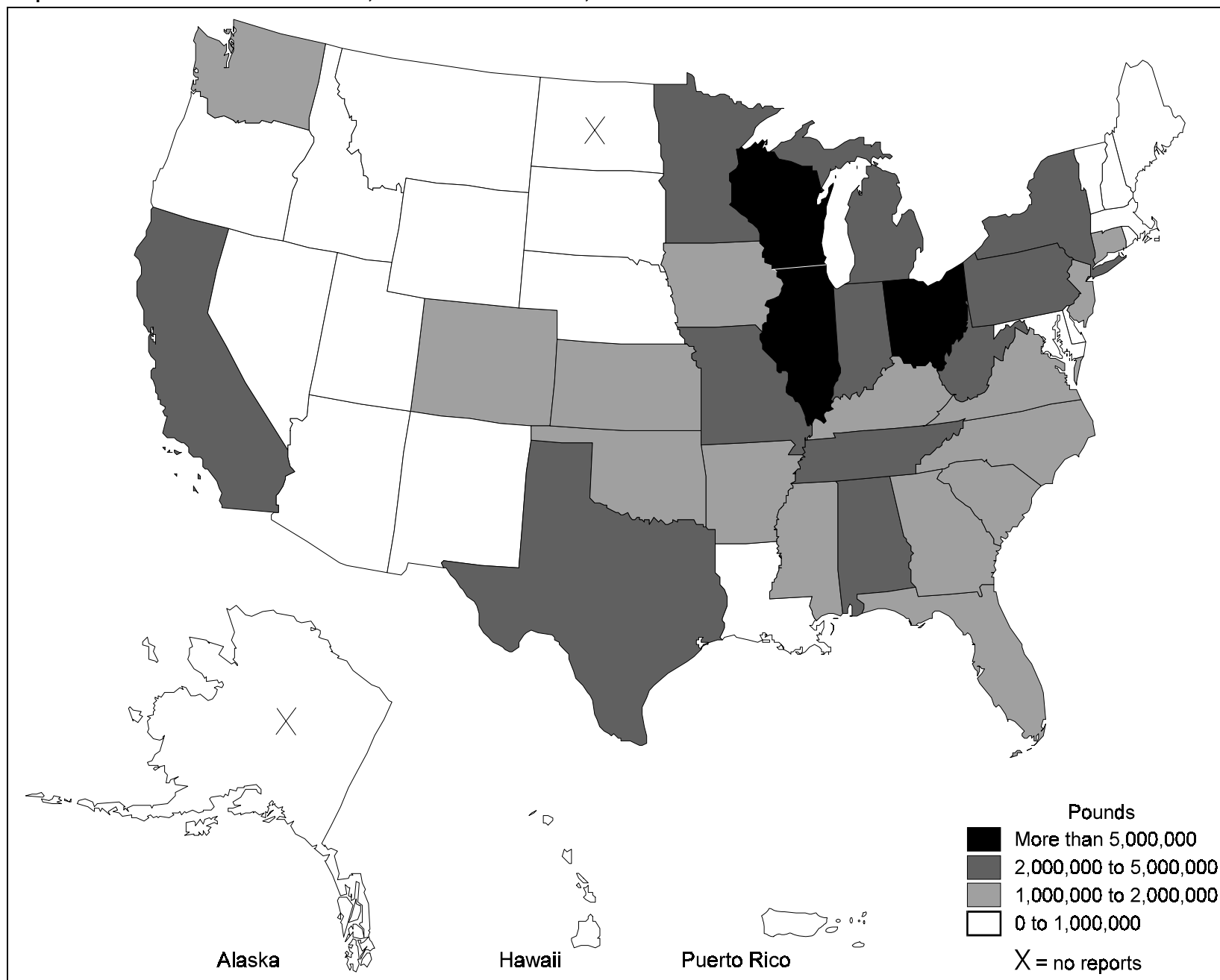
The fabricated metals sector reported 17.2 million pounds of releases of glycol ethers, the top-ranked chemical in this sector for releases, as shown in Table 12-7. Glycol ethers may be used in surface coatings, as a solvent for enamels and spray lacquers, and as a degreaser. As noted earlier, the metal cans industry (SIC code 3411) reported 11.6 million pounds of glycol ethers releases to air. Reported releases of n-butyl alcohol, which ranked second, totaled 9.8 million pounds. The largest use of n-butyl alcohol is in coatings, specifically in nitrocellulose lacquers. Xylenes, also a solvent used in coatings, ranked third with 9.4 million pounds. Air emissions dominated the reported releases for all three chemicals. Aluminum oxide ranked fourth for total releases, with 8.5 million pounds, almost entirely as off-site releases (transfers to disposal). As noted earlier, one facility in the miscellaneous metal stamping industry (SIC code 3469) reported 8.0 million pounds of off-site releases (transfers to disposal) of aluminum oxide.

## **OSHA Carcinogens**

The fabricated metals sector reported 13.4 million pounds of releases of chemicals designated as OSHA carcinogens in 1996, as shown in Table 12-8. (OSHA carcinogens and the bases for their designation appear in Box 1-9 in Chapter 1.) The majority—12.3 million pounds or 91.6%—was reported as air emissions. The sector also reported 994,000 pounds of off-site releases (transfers to disposal) of OSHA carcinogens.

Three of the sector's top 15 chemicals for total on- and off-site releases were OSHA carcinogens

Map 12-1. Total On- and Off-site Releases, 1996: Fabricated Metals, SIC Code 34



**Note:** On-site Releases from Section 5 of Form R and Off-site Releases from Section 6 (transfers off-site to disposal) of Form R.



## Chapter 12 — TRI Data for Fabricated Metals

**Table 12-7. The 15 Chemicals with the Largest Total On-site and Off-site Releases, 1996: Fabricated Metals, SIC Code 34 (in Rank Order)**

CAS Number	Chemical	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection		On-site Land Releases		Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
				Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds			
--	Glycol ethers	17,208,967	1,326	0	0	0	208	17,210,501	10,854	17,221,355
71-36-3	n-Butyl alcohol	9,784,045	250	0	0	250	78	9,784,623	526	9,785,149
1330-20-7	Xylene (mixed isomers)	9,383,016	16	0	0	250	3,983	9,387,265	20,400	9,407,665
1344-28-1	Aluminum oxide (fibrous forms)	13,000	0	0	0	0	0	13,000	8,505,770	8,518,770
79-01-6	Trichloroethylene	7,600,608	116	0	0	550	1,200	7,602,474	14,444	7,616,918
--	Zinc compounds	228,336	20,021	0	0	19,923	83,578	351,858	5,218,403	5,570,261
78-93-3	Methyl ethyl ketone	5,432,423	13,420	0	0	0	66,275	5,512,118	4,946	5,517,064
108-88-3	Toluene	4,386,423	5	0	0	0	13,292	4,399,720	24,324	4,424,044
127-18-4	Tetrachloroethylene	2,511,011	7	0	0	0	0	2,511,018	0	2,511,018
75-09-2	Dichloromethane	1,787,938	5	0	0	0	0	1,787,943	0	1,787,943
110-54-3	n-Hexane	1,727,985	0	0	0	0	0	1,727,985	0	1,727,985
108-10-1	Methyl isobutyl ketone	1,667,080	5	0	0	0	0	1,667,085	272	1,667,357
--	Chromium compounds	24,443	1,714	78	0	108,603	28,193	163,031	991,081	1,154,112
7439-96-5	Manganese	194,066	2,133	0	7	7,755	59,523	263,484	621,238	884,722
71-55-6	1,1,1-Trichloroethane	845,247	10	0	0	4,500	10,518	860,275	0	860,275
	Subtotal	62,794,588	39,028	78	7	141,831	266,848	63,242,380	15,412,258	78,654,638
	Total for SIC Code 34	69,191,876	351,080	563	7	204,331	572,609	70,320,466	19,933,901	90,254,367

**Note:** On-site Releases from Section 5 of Form R. Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.

(see Table 12-7). These were trichloroethylene with 7.6 million pounds of releases, tetrachloroethylene with 2.5 million pounds, and dichloromethane with 1.8 million pounds. The great majority of these reported releases was air emissions. The sector also reported releases of 479,000 pounds of nickel and 416,000 pounds of nickel compounds, among other OSHA carcinogens. These were both largely off-site releases (transfers to disposal).

As shown in Table 12-8, the miscellaneous fabricated metal products industry (SIC code 3499) reported the largest releases of OSHA carcinogens in the fabricated metals sector. This industry reported 2.7 million pounds of total releases of these chemicals. The plating and polishing industry (SIC code 3471) ranked second, reporting 2.03 million pounds of OSHA carcinogen releases. The multiple-codes group ranked third with 1.97 million pounds, and the miscellaneous metal stampings industry (SIC code 3469) ranked fourth with 1.7 million pounds. In all four industries, half or more of the total on- and off-site releases consisted of air emissions of

trichloroethylene (miscellaneous fabricated metal products, 1.5 million pounds; plating and polishing, 1.2 million pounds; multiple-codes forms, 964,000 pounds; and miscellaneous metal stampings, 1.2 million pounds).

Figure 12-7 shows the on- and off-site releases of the four-digit SIC codes with the largest OSHA carcinogen releases.

## 1996 TRI Chemicals in Waste for Fabricated Metals

Table 12-9 presents waste management data for the four-digit SIC codes in the fabricated metals sector. Nearly half (44.7%) of all production-related waste was recycled off-site, 319.9 million pounds out of 716.2 million pounds. On-site recycling accounted for another 148.0 million pounds, or 20.7%. The third-largest waste management option in the fabricated metals sector was on-site treatment, with 113.7 million pounds



**Table 12-8. TRI On-site and Off-site Releases of OSHA Carcinogens by 4-digit SIC Code, 1996: Fabricated Metals, SIC Code 34 (in Rank Order)**

SIC Code	Industry	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection		On-site Land Releases		Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
				Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds			
3499	Fabricated Metal Products, nec*	2,645,026	781	0	0	6,640	250	2,652,697	56,790	2,709,487
3471	Plating & Polishing	1,572,298	1,874	0	0	5,119	3,545	1,582,836	442,621	2,025,457
	Multiple within SIC Code 34	1,854,128	1,032	0	0	4,364	54,929	1,914,453	59,305	1,973,758
3469	Metal Stampings, nec*	1,660,571	532	0	0	0	5	1,661,108	49,420	1,710,528
3429	Hardware, nec*	705,157	610	0	0	0	0	705,767	21,802	727,569
3421	Cutlery	518,077	5	0	0	0	0	518,082	0	518,082
3444	Sheet Metal Work	471,792	4	0	0	0	2,356	474,152	28,413	502,565
3479	Metal Coating & Allied Services	436,969	688	0	0	0	592	438,249	32,136	470,385
3451	Screw Machine Products	419,174	5	0	0	5	0	419,184	751	419,935
3498	Fabricated Pipe & Fittings	321,802	250	0	0	0	8,889	330,941	7,604	338,545
3496	Misc. Fabricated Wire Products	290,467	36	0	0	0	0	290,503	45,626	336,129
3452	Bolts, Nuts, Rivets, & Washers	319,481	0	0	0	0	0	319,481	9,160	328,641
3443	Fabricated Plate Work (Boiler Shops)	143,520	899	0	0	0	919	145,338	46,621	191,959
3494	Valves & Pipe Fittings, nec*	139,847	34	0	0	3,411	5	143,297	7,180	150,477
3412	Metal Barrels, Drums, & Pails	101,914	0	0	0	0	0	101,914	0	101,914
3423	Hand & Edge Tools, nec*	64,324	260	0	0	0	0	64,584	37,201	101,785
3462	Iron & Steel Forgings	16,049	2,010	0	0	0	4,805	22,864	67,610	90,474
	Invalid SIC Code within SIC Code 34	73,776	10	0	0	0	0	73,786	7,915	81,701
3442	Metal Doors, Sash, & Trim	81,259	0	0	0	0	5	81,264	0	81,264
3449	Miscellaneous Metal Work	75,320	0	0	0	0	0	75,320	255	75,575
3465	Automotive Stampings	57,271	0	0	0	0	0	57,271	6,552	63,823
3446	Architectural Metal Work	58,071	0	0	0	0	0	58,071	2,358	60,429
3432	Plumbing Fixture Fittings & Trim	47,139	507	0	0	250	0	47,896	10,113	58,009
3448	Prefabricated Metal Buildings	54,795	0	0	0	0	0	54,795	35	54,830
3484	Small Arms	42,383	5	0	0	0	0	42,388	3,517	45,905
3441	Fabricated Structural Metal	18,841	1,174	0	0	0	23,033	43,048	1,305	44,353
3482	Small Arms Ammunition	24,296	0	0	0	0	0	24,296	19,267	43,563
3463	Nonferrous Forgings	23,028	2	0	0	0	5	23,035	11,326	34,361
3489	Ordnance & Accessories, nec*	22,000	0	0	0	0	0	22,000	0	22,000
3492	Fluid Power Valves & Hose Fittings	16,271	0	0	0	0	0	16,271	3,110	19,381
3491	Industrial Valves	12,851	5	0	0	0	0	12,856	776	13,632
3495	Wire Springs	9,788	0	0	0	0	0	9,788	3,400	13,188
3411	Metal Cans	10,846	0	0	0	0	0	10,846	0	10,846
3497	Metal Foil & Leaf	222	1	0	0	0	0	223	8,257	8,480
3483	Ammunition, Exc. For Small Arms, nec*	4,557	0	0	0	0	0	4,557	0	4,557
3425	Saw Blades & Handsaws	301	0	0	0	0	0	301	3,123	3,424
3493	Steel Springs, Except Wire	0	3	0	0	0	0	3	292	295
3433	Heating Equipment, Except Electric	274	0	0	0	0	0	274	10	284
3431	Metal Sanitary Ware	30	0	0	0	0	0	30	0	30
	Subtotal	12,313,915	10,727	0	0	19,789	99,338	12,443,769	993,851	13,437,620
	Total for SIC Code 34	69,191,876	351,080	563	7	204,331	572,609	70,320,466	19,933,901	90,254,367

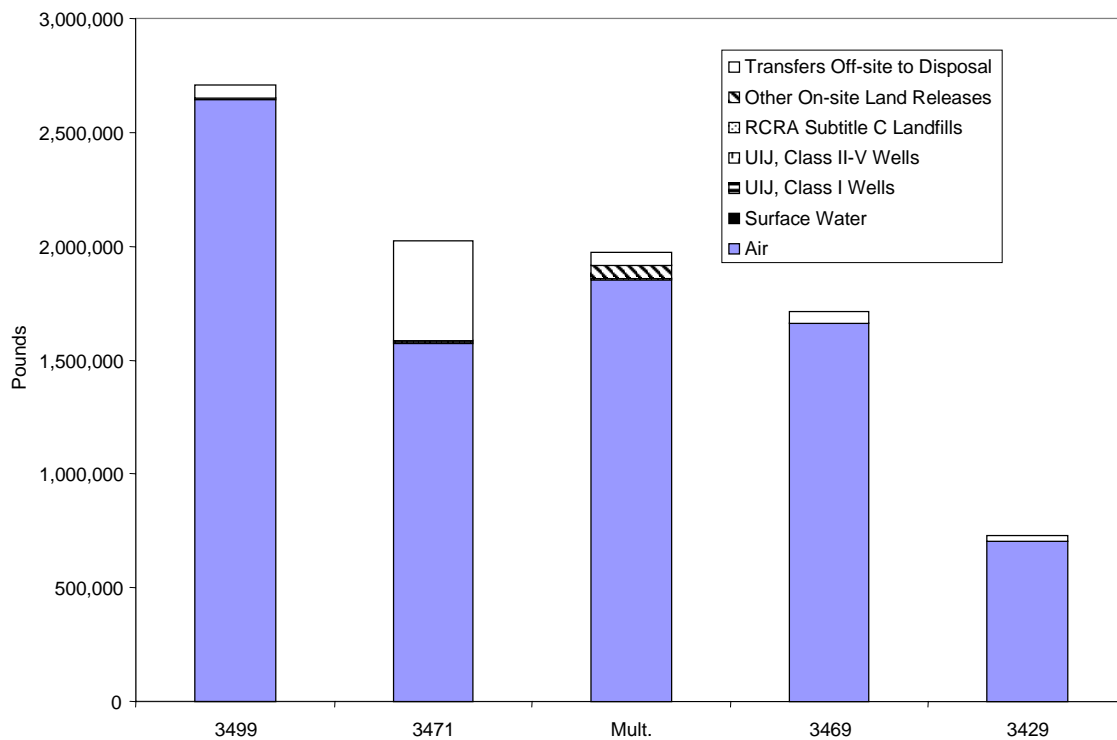
**Note:** On-site Releases from Section 5 of Form R. Off-site Releases from Section 6 (off-site transfers to disposal) of Form R. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category.

\*nec: not elsewhere classified.

or 15.9%. The sector reported 83.4 million pounds of quantities released on- and off-site, which was 11.6% of total production-related waste. Other waste management methods represented less than 5% each of the sector's total. Figure 12-8 shows the distribution of on-site waste management, off-site waste management, and quantities released on- and off-site in this sector.

A total of six industry groups at the four-digit SIC code level ranked first or second in the various waste management types shown in Table 12-9.

Multiple-codes forms in SIC code 34 reported the sector's largest total production-related waste, with 100.1 million pounds. This multiple-codes group ranked second for on-site recycling, with



**Figure 12-7. TRI On-site and Off-site Releases of OSHA Carcinogens, SIC Codes with Largest Totals, 1996: Fabricated Metals (SIC Code 34)**

**Note:** On-site Releases from Section 5 of Form R. Off-site Releases from Section 6 (off-site transfers to disposal) of Form R. UIJ = underground injection. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category.

23.3 million pounds, and first for off-site recycling, with 60.4 million pounds. One multiple-codes facility (reporting SIC codes 3451, 3492, and 3494) reported off-site recycling of 12.7 million pounds of copper, and a second facility (SIC codes 3432, 3451, and 3471) reported off-site recycling of 6.9 million pounds of copper compounds.

The cutlery industry (SIC code 3421) ranked first for on-site recycling, with 46.5 million pounds. The plumbing fixture fittings and trim (SIC code 3432) ranked second for off-site recycling, with 41.1 million pounds.

The plating and polishing industry (SIC code 3471) ranked second among fabricated metals industries for total production-related waste. This industry reported 90.4 million pounds of

production-related waste, including 35.1 million pounds of on-site treatment and 6.8 million pounds of off-site treatment. Plating and polishing ranked first in this sector in amounts reported for both on- and off-site treatment.

The metal coating industry (SIC code 3479) reported the sector's largest amount of on-site energy recovery, with 10.0 million pounds, and ranked second in three waste management categories: off-site energy recovery (4.3 million pounds), off-site treatment (2.3 million pounds), and quantities released (11.7 million pounds).

The metal cans industry (SIC code 3411) reported the sector's largest quantities released, with 24.8 million pounds. This industry also reported the largest amount of off-site energy recovery, with 4.4 million pounds. The metal cans industry ranked second for on-site energy recovery (6.2

**Table 12-9. Quantities of TRI Chemicals in Waste by 4-digit SIC Code, 1996: Fabricated Metals, SIC Code 34 (in Rank Order)**

SIC Code	Industry	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Recycled Off-site Pounds	Energy Recovery Off-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	Total Production-related Waste Pounds	Non-Production-related Waste Pounds
	Multiple within SIC Code 34	23,291,102	522,460	7,785,008	60,410,417	618,871	1,478,535	5,945,618	100,052,011	4,658
3471	Plating & Polishing	20,459,311	13,266	35,103,079	19,296,648	445,161	6,821,735	8,289,387	90,428,587	2,341
3479	Metal Coating & Allied Services	1,245,002	9,999,980	23,406,689	21,824,249	4,301,138	2,302,872	11,732,973	74,812,903	21,190
3411	Metal Cans	258,637	6,163,803	29,244,843	6,074,340	4,409,525	245,748	24,785,920	71,182,816	2,131
3432	Plumbing Fixture Fittings & Trim	8,769,918	0	168,747	41,093,067	5,237	81,506	290,227	50,408,702	0
3421	Cutlery	46,457,548	0	36,544	412,449	0	32,896	792,469	47,731,906	0
3494	Valves & Pipe Fittings, nec*	14,223,712	0	45,367	23,857,923	8,673	73,928	387,108	38,596,711	0
3469	Metal Stampings, nec*	993,999	2,091	684,833	30,812,183	355,988	682,666	2,469,567	36,001,327	27,165
3499	Fabricated Metal Products, nec*	2,211,011	0	2,112,596	14,430,455	269,956	838,551	5,698,527	25,561,096	1,576
3429	Hardware, nec*	6,289,366	29,981	1,094,975	10,194,798	11,686	209,810	1,734,951	19,565,567	1,936
3462	Iron & Steel Forgings	1,808,995	0	116,304	15,986,785	10,000	53,851	1,374,435	19,350,370	0
3451	Screw Machine Products	135,700	94,003	224,971	17,735,483	16,934	250,554	427,982	18,885,627	200
3463	Nonferrous Forgings	12,789,900	0	88,464	1,716,274	0	390,245	164,892	15,149,775	0
3497	Metal Foil & Leaf	539,848	0	5,438,959	6,891,896	838,544	462,349	295,699	14,467,295	820
3465	Automotive Stampings	16,848	0	377,856	10,754,533	73,077	112,588	301,057	11,635,959	0
3496	Misc. Fabricated Wire Products	283,909	0	1,203,454	5,545,555	17,829	582,559	1,145,771	8,779,077	760
3443	Fabricated Plate Work (Boiler Shops)	5,105	0	1,410,471	4,852,262	55,298	243,710	1,682,777	8,249,623	110
3482	Small Arms Ammunition	500	0	572,645	6,993,739	10,175	32,215	330,661	7,939,935	61,973
3448	Prefabricated Metal Buildings	6,208,600	0	287,118	125,620	34,862	13,726	1,254,720	7,924,646	500
3441	Fabricated Structural Metal	64,522	0	31,811	3,682,573	267,132	139,412	1,835,798	6,021,248	33,230
	Invalid SIC Code within SIC Code 34	586,283	468,800	970,116	1,717,004	217,138	229,991	1,654,989	5,844,321	0
3412	Metal Barrels, Drums, & Pails	87,895	1,247,496	328,535	176,279	981,818	48,843	2,404,897	5,275,763	0
3498	Fabricated Pipe & Fittings	8,000	0	194,025	3,693,542	579	72,956	1,250,641	5,219,743	0
3452	Bolts, Nuts, Rivets, & Washers	28,450	2,100,000	858,092	754,898	24,370	453,374	441,367	4,660,551	0
3491	Industrial Valves	7,980	0	50,000	3,858,672	421	13,107	411,549	4,341,729	0
3444	Sheet Metal Work	68,155	335,100	491,690	1,307,938	75,942	190,499	1,612,420	4,081,744	0
3442	Metal Doors, Sash, & Trim	36,070	0	28,368	121,469	272,080	86,438	2,466,781	3,011,206	0
3492	Fluid Power Valves & Hose Fittings	600	0	7,900	2,586,372	6,701	25,519	47,889	2,674,981	0
3423	Hand & Edge Tools, nec*	403	0	895,907	562,443	3,675	92,031	427,742	1,982,201	0
3431	Metal Sanitary Ware	942,805	0	77,000	357,928	0	157	233,295	1,611,185	0
3433	Heating Equipment, Except Electric	2,464	0	0	514,757	147,491	15,867	343,479	1,024,058	0
3449	Miscellaneous Metal Work	168,070	0	123,262	264,457	7,832	3,906	402,341	969,868	0
3446	Architectural Metal Work	14,168	0	166,228	380,960	37,883	2,358	229,331	830,928	0
3484	Small Arms	0	0	34,897	408,648	12,279	39,361	87,536	582,721	0
3489	Ordnance & Accessories, nec*	1,000	0	66,500	80,100	97,853	5,680	195,294	446,427	1,128
3425	Saw Blades & Handsaws	0	0	0	131,991	0	162,356	84,167	378,514	0
3483	Ammunition, Exc. For Small Arms, nec*	0	0	0	240,350	1,095	1,202	69,341	311,988	0
3493	Steel Springs, Except Wire	0	0	0	41,071	0	0	82,484	123,555	0
3495	Wire Springs	25,000	0	0	37,488	5,337	903	23,143	91,871	0
3466	Crowns & Closures	0	0	0	0	2,252	0	28,865	31,117	0
	Total for SIC Code 34	148,030,876	20,976,980	113,727,254	319,927,616	13,644,832	16,494,004	83,438,090	716,239,652	159,718

**Note:** Data from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the “multiple” category. One facility reported incorrectly in SIC code 3999 for 1996. The facility should have reported in SIC code 3499. The incorrectly reported amounts were as follows: 3,209,200 pounds of recycling on-site, 573 pounds of treatment on-site, 206,766 pounds of recycling off-site, 567 pounds of treatment off-site, 13 pounds of quantity released on- and off-site and 3,417,119 pounds of total production-related waste.

\*nec: not elsewhere classified.

million pounds) and on-site treatment (29.2 million pounds).

Distribution of production-related waste for the top industries in the sector appears in Figure 12-9.

## Projected Quantities of TRI Chemicals in Waste

The fabricated metals sector’s projections of waste management data through 1998 appear in

Table 12-10. (As explained in Chapter 1, facilities not only report current data but project waste management quantities for the next two years in their TRI submissions.) Total production-related waste was projected to decrease 4.3% from 716.2 million pounds in 1996 to 685.5 million pounds in 1998. The projected 30.8 million-pound reduction in total production-related waste reflected projected decreases in all waste management methods except on-site energy recovery.



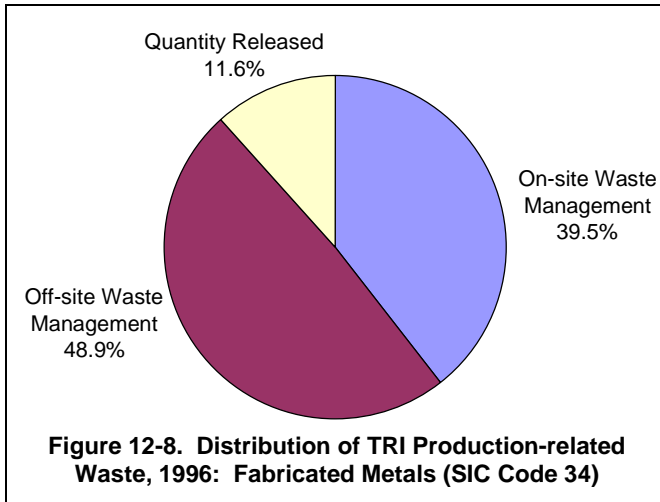
## Chapter 12 — TRI Data for Fabricated Metals

The largest reduction (in pounds) was projected in quantities released, from 83.4 million pounds in 1996 to 73.4 million pounds in 1998. Off-site recycling was projected to decrease from 319.9 million pounds to 310.5 million pounds. Each of

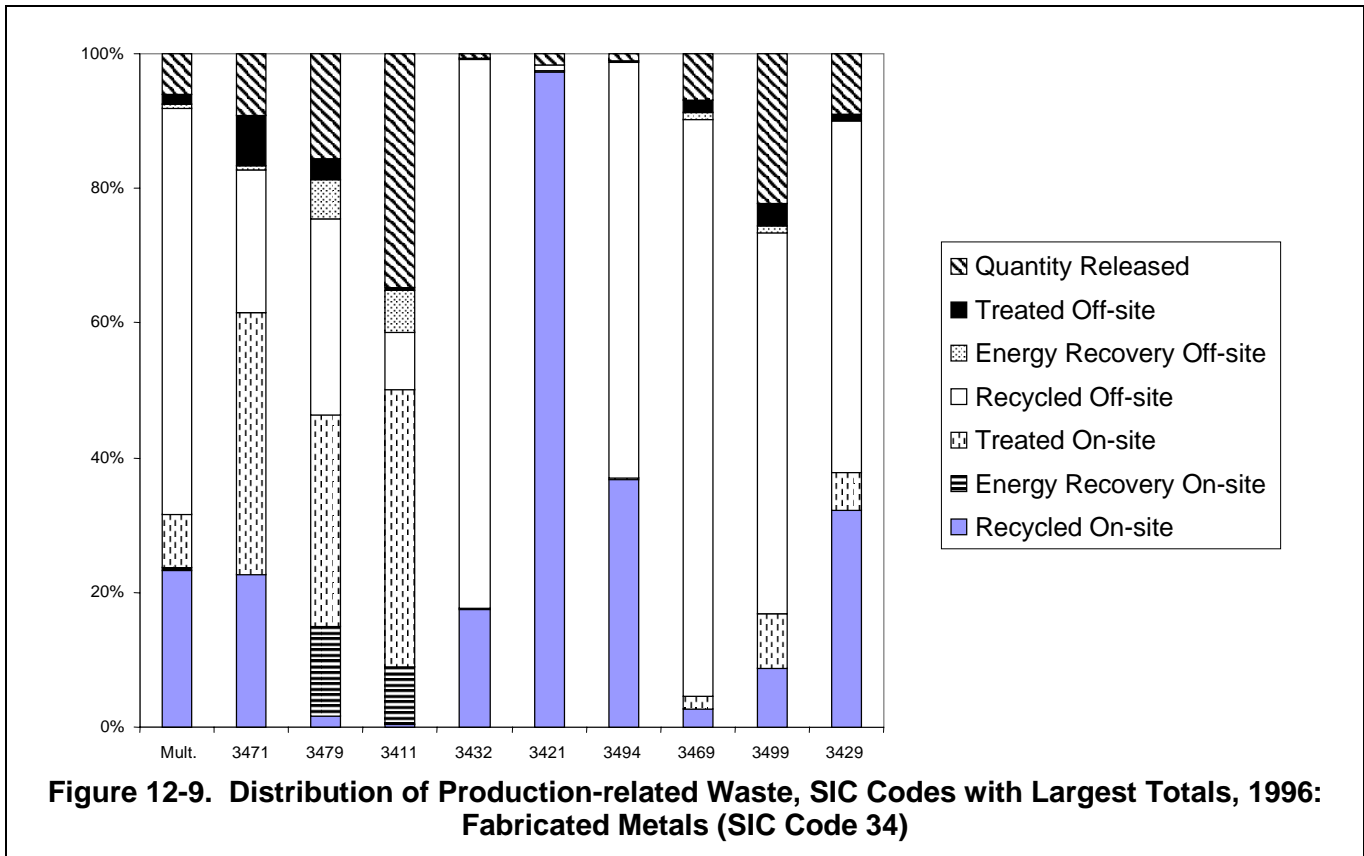
these represented a reduction of more than 9 million pounds. The sector projected a reduction in on-site recycling from 148.0 million pounds to 142.6 million pounds and a reduction in on-site treatment from 113.7 million pounds to 108.8 million pounds. Each of these represented a reduction of about 5 million pounds.

Smaller (absolute) reductions were projected in off-site energy recovery, from 13.6 million pounds to 11.8 million pounds (1.8 million-pound reduction) and in off-site treatment, from 16.5 million pounds to 15.7 million pounds (an 806,000 pound reduction).

In percentage terms, these reductions ranged from a 2.9% decrease in off-site recycling, the sector's largest reported method of waste management, to a 13.5% decrease in off-site energy recovery, the sector's smallest reported method.



**Note:** Data from Section 8 of Form R.



**Note:** Data from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category.





**Table 12-10. Current Year and Projected Quantities of TRI Chemicals in Waste, 1996-1998: Fabricated Metals, SIC Code 34**

Waste Management Activity	Current Year 1996		Projected 1997		Projected 1998	
	Total Pounds	Percent of Total	Total Pounds	Percent of Total	Total Pounds	Percent of Total
<u>On-site Waste Management</u>						
Recycled On-site	148,030,876	20.7	146,389	21.3	142,623,630	20.8
Energy Recovery On-site	20,976,980	2.9	22,274,077	3.2	22,545,277	3.3
Treated On-site	113,727,254	15.9	108,249,701	15.8	108,833,060	15.9
<u>Off-site Waste Management</u>						
Recycled Off-site	319,927,616	44.7	306,732,133	44.7	310,549,043	45.3
Energy Recovery Off-site	13,644,832	1.9	12,406,580	1.8	11,808,668	1.7
Treated Off-site	16,494,004	2.3	16,601,195	2.3	15,688,349	2.3
Quantity Released On- and Off-site	83,438,090	11.6	74,583,524	10.9	73,430,246	10.7
Total Production-related Waste for SIC Code 34	716,239,652	100.0	686,697,161	100.0	685,478,273	100.0
Waste Management Activity	Projected Change		Projected Change		Projected Change	
	1996-1997	Percent	1997-1998	Percent	1996-1998	Percent
<u>On-site Waste Management</u>						
Recycled On-site	-1.1		-2.6		-3.7	
Energy Recovery On-site	6.2		1.2		7.5	
Treated On-site	-4.8		0.5		-4.3	
<u>Off-site Waste Management</u>						
Recycled Off-site	-4.1		1.2		-2.9	
Energy Recovery Off-site	-9.1		-4.8		-13.5	
Treated Off-site	-2.6		-2.3		-4.9	
Quantity Released On- and Off-site	-10.6		-1.5		-12.0	
Total Production-related Waste for SIC Code 34	-4.1		-0.2		-4.3	

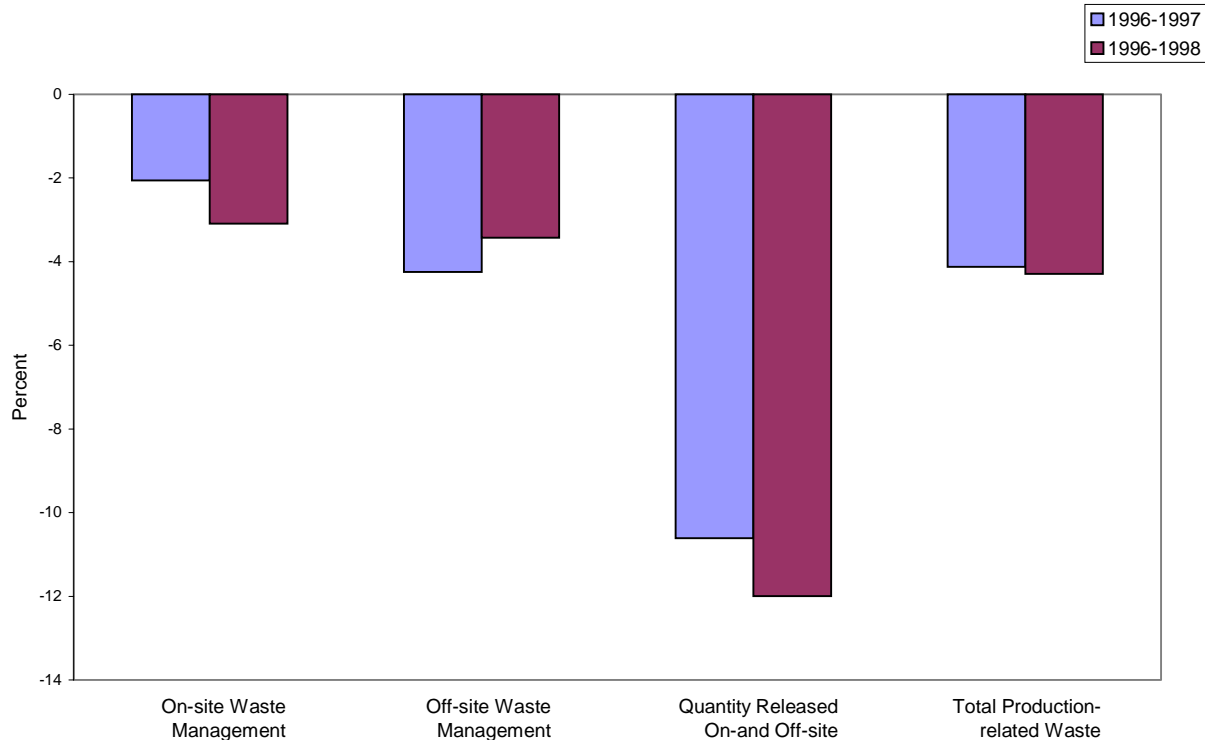
**Note:** Current year and projected year amounts are all taken from Section 8 of Form R for 1996.

A 1.6 million-pound increase was projected in on-site energy recovery, from 21.0 million pounds to 22.5 million pounds (a 7.5% increase).

Figure 12-10 illustrates the projected percentage changes in the fabricated metals sector's waste management methods.

The projected changes represent little potential difference in the ways in which the fabricated

metals sector manages its TRI chemicals in waste. The sector's releases were projected to decline from 11.6% of total production-related waste in 1996 to 10.7% in 1998. Essentially no change at all was expected in the proportion of total production-related waste managed by recycling, energy recovery, and treatment. Thus, the sector projected no real movement up the waste management hierarchy, explained in Chapter 1.



**Figure 12-10. Projected Percentage Change in Quantities of TRI Chemicals in Waste, 1996-1998: Fabricated Metals (SIC Code 34)**

**Note:** Current year and projected year amounts are all taken from Section 8 of Form R for 1996.

## Source Reduction Activity

Of the 7,416 forms submitted by the fabricated metals sector, 1,440 forms indicated one or more source reduction activities underway during 1996, as shown in Table 12-11. The plating and polishing industry (SIC code 3471) submitted 290 forms indicating such activity. The metal coating industry (SIC code 3479) submitted 205 forms indicating source reduction activity. These submissions represented approximately 23% of the forms in both industries. In three industrial groups, more than 100 forms reported source reduction activity in 1996. These were the multiple-codes group (124 forms), the metal cans industry (SIC code 3411, 121 forms), and miscellaneous fabricated metal products (SIC code 3499, 114 forms). In these groups, the forms reporting source reduction activity represented 18% to 20% of all forms submitted.

As shown in Table 12-11, half (728 forms) of the forms reporting source reduction activity indicated improved operating practices. Other activities frequently cited were process modifications (338 forms) and raw material modifications (224 forms).

## Year-to-Year Comparisons for Fabricated Metals

### 1995-1996 TRI Data for Fabricated Metals

The fabricated metals sector submitted 7,893 forms in 1995 and 7,416 forms in 1996, a 6% decrease, as shown in Table 12-12. Although the number of Form As submitted was relatively



Table 12-11. Number of Forms Reporting Source Reduction Activity, 1996: Fabricated Metals, SIC Code 34

SIC Code	Industry	Total Forms Number	Forms Reporting Source Reduction Activities		Category of Source Reduction Activity							
			Number	Percent of All Forms	Good Operating Practices Number	Inventory Control Number	Spill and Leak Prevention Number	Raw Material Modifications Number	Process Modifications Number	Cleaning and Degreasing Number	Surface Preparation and Finishing Number	Product Modifications Number
3411	Metal Cans	601	121	20.1	84	10	13	53	9	12	59	11
3412	Metal Barrels, Drums, & Pails	149	58	38.9	21	6	3	16	12	2	28	0
3421	Cutlery	37	6	16.2	1	0	2	0	1	2	1	0
3423	Hand & Edge Tools, nec*	68	12	17.6	6	0	1	0	2	0	1	2
3425	Saw Blades & Handsaws	21	1	4.8	1	0	0	0	0	0	0	0
3429	Hardware, nec*	158	19	12.0	7	1	2	4	7	4	4	2
3431	Metal Sanitary Ware	32	6	18.8	0	0	0	1	4	0	0	1
3432	Plumbing Fixture Fittings & Trim	92	29	31.5	16	6	11	6	7	3	1	4
3433	Heating Equipment, Except Electric	43	7	16.3	5	0	0	0	0	0	0	2
3441	Fabricated Structural Metal	341	31	9.1	12	5	1	7	5	2	8	2
3442	Metal Doors, Sash, & Trim	127	30	23.6	11	0	3	8	7	1	5	3
3443	Fabricated Plate Work (Boiler Shops)	269	54	20.1	33	7	1	9	5	2	7	1
3444	Sheet Metal Work	139	27	19.4	13	8	1	3	2	2	6	1
3446	Architectural Metal Work	24	0	0.0	0	0	0	0	0	0	0	0
3448	Prefabricated Metal Buildings	83	17	20.5	4	0	1	5	3	0	6	6
3449	Miscellaneous Metal Work	51	8	15.7	3	0	0	5	0	2	2	0
3451	Screw Machine Products	113	11	9.7	4	0	0	0	2	5	0	0
3452	Bolts, Nuts, Rivets, & Washers	139	19	13.7	16	1	3	0	3	1	0	1
3462	Iron & Steel Forgings	200	24	12.0	15	3	1	5	6	0	2	1
3463	Nonferrous Forgings	38	9	23.7	7	0	0	0	0	0	2	0
3465	Automotive Stampings	105	10	9.5	1	0	0	1	0	0	0	8
3466	Crowns & Closures	3	0	0.0	0	0	0	0	0	0	0	0
3469	Metal Stampings, nec*	303	74	24.4	30	1	11	5	23	14	3	2
3471	Plating & Polishing	1,241	290	23.4	153	38	48	25	86	62	7	4
3479	Metal Coating & Allied Services	883	205	23.2	130	19	11	8	35	20	30	9
3482	Small Arms Ammunition	50	6	12.0	1	0	1	3	0	1	0	0
3483	Ammunition, Exc. For Small Arms, nec*	5	1	20.0	1	0	0	0	0	0	0	0
3484	Small Arms	24	3	12.5	2	0	0	0	0	1	0	0
3489	Ordnance & Accessories, nec*	12	5	41.7	0	2	0	0	2	1	0	0
3491	Industrial Valves	59	10	16.9	3	1	6	4	1	4	0	0
3492	Fluid Power Valves & Hose Fittings	34	5	14.7	1	0	0	0	4	1	1	0
3493	Steel Springs, Except Wire	10	4	40.0	4	0	0	1	0	0	0	0
3494	Valves & Pipe Fittings, nec*	196	20	10.2	13	2	4	0	2	4	1	0
3495	Wire Springs	12	4	33.3	0	0	0	3	0	1	0	0
3496	Misc. Fabricated Wire Products	213	20	9.4	11	0	4	4	7	3	2	0
3497	Metal Foil & Leaf	47	20	42.6	9	0	0	6	10	1	3	1
3498	Fabricated Pipe & Fittings	81	12	14.8	7	1	0	1	3	3	0	0
3499	Fabricated Metal Products, nec*	623	114	18.3	47	14	7	17	35	14	15	10
Multiple within SIC Code 34		688	124	18.0	43	12	17	22	42	23	15	5
Invalid SIC Code within SIC Code 34		102	24	23.5	13	8	8	2	13	1	9	0
Total for SIC Code 34		7,416	1,440	19.4	728	145	160	224	338	192	218	76

**Note:** Forms with more than one 4-digit SIC code within code 34 are assigned to the "multiple" category.

**\*nec:** not elsewhere classified.

small, these submissions increased 27.7% from 408 forms to 521. (The Form A certification statement is explained in Chapter 1.) This may reflect more widespread awareness of the Form A certification statement in its second year of availability.

### On- and Off-site Releases

Total on- and off-site releases reported by the fabricated metals sector decreased 7.0% from

1995 to 1996, despite a 51.9% increase in off-site releases (transfers to disposal), as shown in Table 12-12 and Figure 12-11. On- and off-site releases totaled 97.0 million pounds in 1995 and 90.3 million pounds in 1996, a reduction of 6.8 million pounds. Off-site releases (transfers to disposal) increased from 13.1 million pounds in 1995 to 19.9 million pounds in 1996, an increase of 6.8 million pounds. One facility in the miscellaneous metal stampings industry (SIC code 3469) reported off-site releases of 1.2 million pounds of

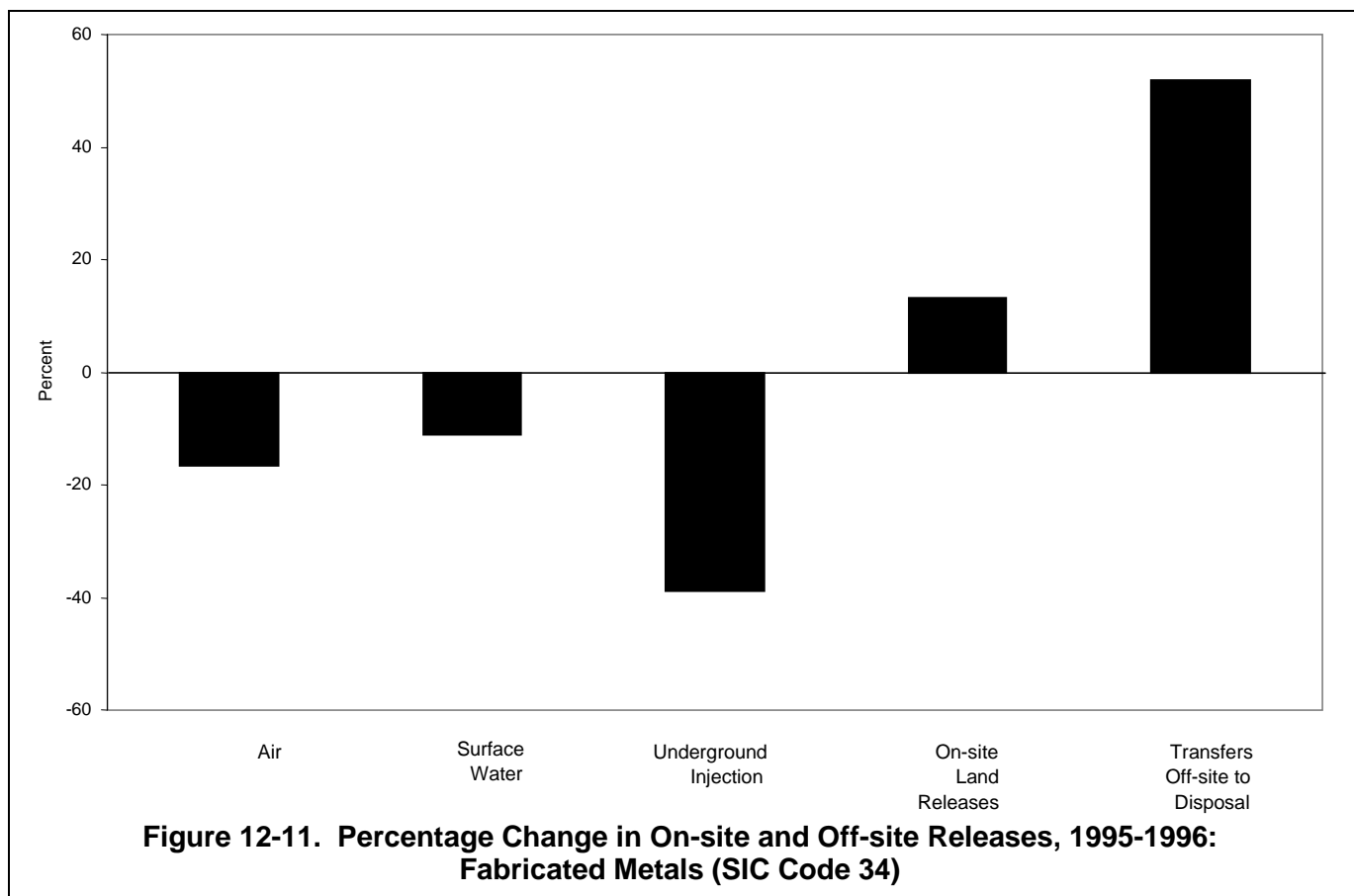


## Chapter 12 — TRI Data for Fabricated Metals

**Table 12-12. Comparison of TRI On-site and Off-site Releases, Other On-site Waste Management, and Transfers Off-site for Further Waste Management, 1995-1996: Fabricated Metals, SIC Code 34**

	1995 Number	1996 Number	Change 1995 to 1996 Percent
Total Facilities	2,973	2,883	-3.0
Total Forms	7,893	7,416	-6.0
Form Rs	7,485	6,895	-7.9
Form As	408	521	27.7
	Pounds	Pounds	Percent
<u>On-site Releases</u>			
Total Air Emissions	82,836,389	69,191,876	-16.5
Fugitive Air	28,648,445	23,613,262	-17.6
Point Source Air	54,187,944	45,578,614	-15.9
Surface Water Discharges	395,001	351,080	-11.1
Underground Injection	931	570	-38.8
On-site Land Releases	685,640	776,940	13.3
Total On-site Releases	83,917,961	70,320,466	-16.2
<u>Off-site Releases</u>			
Transfers Off-site to Disposal	13,120,660	19,933,901	51.9
Total On- and Off-site Releases	97,038,621	90,254,367	-7.0
<u>Other On-site Waste Management</u>			
Recycled On-site	152,113,451	148,030,876	-2.7
Energy Recovery On-site	19,352,037	20,976,980	8.4
Treated On-site	134,688,285	113,727,254	-15.6
Total Other On-site Waste Management	306,153,773	282,735,110	-7.6
<u>Transfers Off-site for Further Waste Management</u>			
Transfers to Recycling	316,886,128	303,449,098	-4.2
Transfers to Energy Recovery	14,491,702	13,729,060	-5.3
Transfers to Treatment	11,332,910	12,677,769	11.9
Transfers to POTWs	5,786,056	6,597,522	14.0
Other Off-site Transfers	142,224	88,546	-37.7
Total Transfers Off-site for Further Waste Management	348,639,020	336,541,995	-3.5

**Note:** **On-site Releases** from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Other On-site Waste Management** from Section 8 of Form R. **Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. Breakdown of Underground Injection and On-site Land Releases not required in 1995. Other Off-site Transfers are transfers reported without a valid waste management code.



**Note:** On-site Releases from Section 5 of Form R and Off-site Releases from Section 6 (transfers off-site to disposal) of Form R. Breakdown of Underground Injection and On-site Land Releases not required in 1995.

aluminum oxide in 1995 and 8.0 million pounds in 1996, an increase of 6.9 million pounds.

The largest factor in the overall reduction was a 16.5% decrease in air emissions, from 82.8 million pounds to 69.2 million pounds, a reduction of 13.6 million pounds. About two-thirds (63.1%) of this reduction in releases to air was reported in point-source emissions, and the remaining third (36.9%) in fugitive emissions.

The sector reported much smaller amounts in other release types. Surface water discharges decreased from 395,000 pounds in 1995 to 351,000 pounds in 1996. Underground injection was less than 1,000 pounds in both years. The only on-site release type to show an increase was on-site land releases, which increased from 686,000 pounds to 777,000 pounds.

### Other On-site Waste Management

The fabricated metals sector reported 306.2 million pounds of other on-site waste management in 1995 and 282.7 million pounds in 1996. These data also appear in Table 12-12. This 7.6% reduction amounted to a decrease of 23.4 million pounds. Much of this reduction occurred in reporting of on-site treatment, which decreased 15.6% (or 21.0 million pounds), from 134.7 million pounds in 1995 to 113.7 million pounds in 1996.

On-site recycling also decreased from 152.1 million pounds to 148.0 million pounds (a 2.7% reduction), while on-site energy recovery increased from 19.4 million pounds to 21.0 million pounds (an 8.4% increase).



### Transfers Off-site for Further Waste Management

Table 12-12 also presents the fabricated metals sector's reporting of transfers off-site for further waste management for 1995 and 1996. Total transfers off-site for further waste management decreased 3.5% (12.1 million pounds) from 348.6 million pounds in 1995 to 336.5 million pounds in 1996.

Transfers to recycling were both the largest type of transfer reported by this sector and the type with the largest reduction (in pounds). The sector reported 316.9 million pounds of transfers to recycling in 1995 and 303.4 million pounds in 1996. This 4.2% reduction amounted to a decrease of 13.4 million pounds. A smaller reduction was reported in transfers to energy recovery (from 14.5 million pounds to 13.7 million pounds).

The sector reported increased amounts for transfers to treatment (from 11.3 million pounds to 12.7 million pounds) and to POTWs (from 5.8 million pounds to 6.6 million pounds).

### **1988-1996 TRI Data for Fabricated Metals**

As explained in Chapter 1, comparisons from the 1988 TRI baseline year to the current year rely on the list of "core" TRI chemicals that were reportable, with the same reporting definition, in all years. These multi-year comparisons also review only the data elements that were collected in all years, which excludes from this section any analysis that distinguishes RCRA subtitle C landfills from other land releases as well as analysis based on the types of underground injection wells. On-site waste management data and transfers off-site to recycling and to energy recovery have been collected only since 1991; these data are included, but cannot be compared across the full 1988-1996 period.

From 1988 to 1996, the fabricated metals sector's reporting of on- and off-site releases of the "core" chemicals decreased by 51.6%, from 160.4 million pounds to 77.6 million pounds, as shown in Table 12-13. The largest reduction (in pounds) was reported in air emissions, from 125.6 million pounds to 65.5 million pounds. Decreases in both fugitive and point-source emissions contributed to this 47.9% reduction in releases to air. The sector also reported reductions in other on-site release types. Although these decreases ranged from 81.8% to 99.6%, they represented smaller amounts.

The fabricated metals sector reported 30.0 million pounds of off-site releases (transfers to disposal) in 1988 and 11.3 million pounds in 1996, a 62.3% reduction.

Figure 12-12 illustrates the sector's 1988-1996 percentage change in on- and off-site releases.

On-site waste management and transfers off-site for recycling or energy recovery were not collected in 1988. For the 1994-1996 period, the fabricated metals sector recorded a 121.9 million-pound reduction in other on-site waste management, from 378.2 million pounds to 256.3 million pounds. This was largely attributable to a reduction of 112.3 million pounds in on-site recycling, from 258.5 million pounds to 146.2 million pounds. On-site treatment also decreased, from 98.9 million pounds to 89.1 million pounds (a 9.8 million-pound reduction). The sector reported an increase in on-site energy recovery from 20.7 million pounds to 21.0 million pounds (a 250,000 pound increase). These data also appear in Table 12-13.

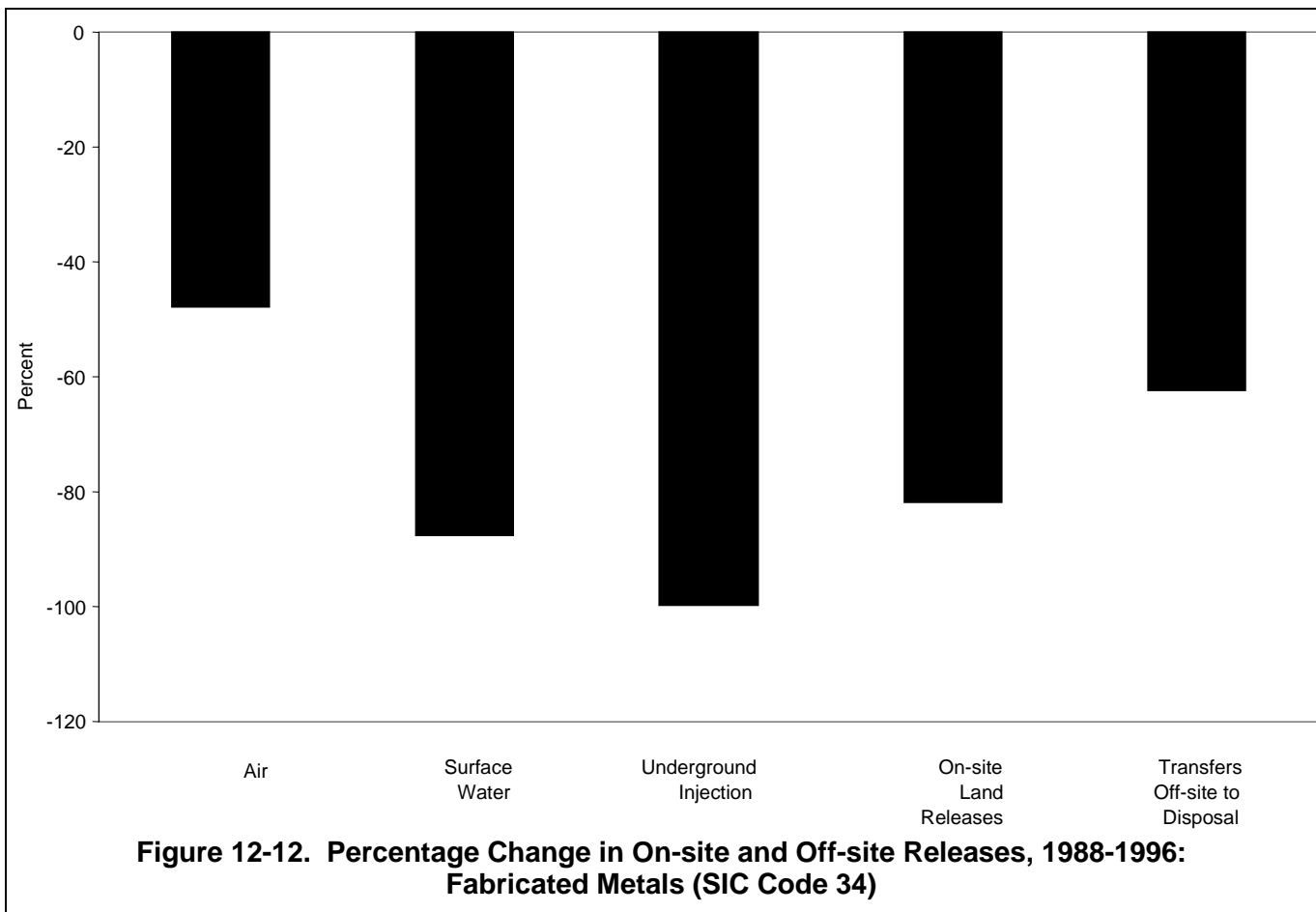
The sector reported decreases of 41.0% and 57.2%, respectively, in transfers to treatment and to POTWs from 1988 to 1996, as shown in Table 12-13. The sector reported 18.4 million pounds of transfers to treatment in 1988 and 10.9 million



**Table 12-13. Comparison of TRI On-site and Off-site Releases, Other On-site Waste Management, and Transfers Off-site for Further Waste Management, 1988 and 1994-1996: Fabricated Metals, SIC Code 34**

	1988 Number	1994 Number	1995 Number	1996 Number	Change 1988 to 1996 Percent
Total Facilities	2,747	2,845	2,763	2,744	-0.1
Total Forms	6,978	7,048	6,915	6,768	-3.0
Form Rs	6,978	7,048	6,579	6,310	-9.6
Form As	NA	NA	336	458	NA
	Pounds	Pounds	Pounds	Pounds	Percent
<u>On-site Releases</u>					
Total Air Emissions	125,627,135	86,251,804	78,389,865	65,503,836	-47.9
Fugitive Air	49,533,320	30,142,237	26,193,451	21,822,343	-55.9
Point Source Air	76,093,815	56,109,567	52,196,414	43,681,493	-42.6
Surface Water Discharges	633,439	73,099	100,161	79,268	-87.5
Underground Injection	154,199	1,885	681	570	-99.6
On-site Land Releases	3,991,275	623,380	631,871	728,061	-81.8
Total On-site Releases	130,406,048	86,950,168	79,122,578	66,311,735	-49.1
<u>Off-site Releases</u>					
Transfers Off-site to Disposal	29,963,711	12,621,888	11,318,363	11,298,798	-62.3
Total On- and Off-site Releases	160,369,759	99,572,056	90,440,941	77,610,533	-51.6
<u>Other On-site Waste Management</u>					
Recycled On-site	NA	258,540,179	136,804,493	146,220,552	NA
Energy Recovery On-site	NA	20,727,035	19,352,037	20,976,980	NA
Treated On-site	NA	98,882,878	90,407,188	89,055,195	NA
Total Other On-site Waste Management	NA	378,150,092	246,563,718	256,252,727	NA
<u>Transfers Off-site for Further Waste Management</u>					
Transfers to Recycling	NA	286,771,401	315,161,842	312,080,751	NA
Transfers to Energy Recovery	NA	14,190,390	14,307,596	13,533,239	NA
Transfers to Treatment	18,398,215	9,276,894	9,294,577	10,861,766	-41.0
Transfers to POTWs	5,577,568	1,771,545	1,995,529	2,387,467	-57.2
Other Off-site Transfers	5,563,733	185,370	100,256	71,544	-98.7
Total Transfers Off-site for Further Waste Management	NA	312,195,600	340,859,8900	328,934,767	NA

**Note:** Does not include delisted chemicals, chemicals added in 1990, 1991, 1994, and 1995, and aluminum oxide, ammonia, hydrochloric acid, and sulfuric acid. **On-site Releases** from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Other On-site Waste Management** from Section 8 of Form R. **Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. Breakdown of Underground Injection and On-site Land Releases not required before 1996. For 1994-1996, Other Off-site Transfers are transfers reported without a valid waste management code. For 1988, Other Off-site Transfers are transfers reported without a valid waste management code or codes not required to be reported in 1988. **NA:** not required to be reported in that year.



**Note:** Does not include delisted chemicals, chemicals added in 1990, 1991, 1994, and 1995, and aluminum oxide, ammonia, hydrochloric acid, and sulfuric acid. **On-site Releases** from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. Breakdown of Underground Injection and On-site Land Releases not required before 1996.

pounds in 1996. The sector also reported 5.6 million pounds of transfers to POTWs in 1988 and 2.4 million pounds in 1996.

### 1988-1996 Data for Four-Digit Industries in Fabricated Metals

Tables 12-14 through 12-16 summarize data for 1988 and 1994-1996 for industries at the four-digit SIC code level within SIC code 34. The tables present, respectively, on- and off-site releases, other on-site waste management, and transfers off-site for further waste management.

#### On- and Off-site Releases

The metal cans industry (SIC code 3411) reported the fabricated metals sector's largest decrease in on- and off-site releases from 1988 to 1996. This industry reported releases totaling 37.6 million pounds in 1988 and 23.4 million pounds in 1996. The reduction was attributable to decreases in reported air emissions. The plating and polishing industry (SIC code 3471) ranked second for decreases, from 17.5 million pounds to 6.4 million pounds. Miscellaneous fabricated metal products (SIC code 3499) reported the third-





largest decrease, from 15.0 million pounds to 5.6 million pounds. For plating and polishing and for miscellaneous fabricated metal products, the overall reductions reflected decreases in all release types.

The sheet metal work industry (SIC code 3444) ranked first for increases in total releases, reporting 1.2 million pounds in 1988 and 1.6 million pounds in 1996. The increase was largely attributable to air emissions. The industrial valves industry (SIC code 3491) reported the sector's second-largest increase, from 128,000 pounds to 417,000 pounds. This industry reported a larger increase in air emissions, partly offset by a reduction in off-site releases (transfers to disposal). However, both industries showed a decrease from 1995 to 1996. No other fabricated metals industry reported an increase in total releases from 1988 to 1996.

Table 12-14 provides release data for all four-digit SIC codes in the fabricated metals sector, for 1988-1996.

### Other On-site Waste Management

The cutlery industry (SIC code 3421) reported the largest decrease in other on-site waste management reported in the fabricated metals sector for 1994-1996 (on-site waste management data were not collected in 1988). This industry reported 111.9 million pounds in 1994 and 46.5 million pounds in 1996. Miscellaneous fabricated metals products (SIC code 3499) reported the second-largest reduction, from 64.7 million pounds to 4.2 million pounds. (One facility erroneously reported in SIC code 39 in 1996. The facility should have reported in SIC code 3499. This error does not affect the ranking of SIC code 3499 as second for decreases in other on-site waste management.) Ranking third for decreases, the multiple-codes group reported 50.8 million pounds in 1994 and 29.9 million pounds

in 1996. The majority of the reduction in all three industry groups was reported in on-site recycling.

The nonferrous forgings industry (SIC code 3463) reported the sector's largest increase in other on-site waste management, from 283,000 pounds in 1994 to 12.9 million pounds in 1996. One facility in SIC code 3463 submitted forms for copper in 1994 and 1995 with no on-site recycling; in 1996, this facility reported recycling 12.8 million pounds of copper on-site. The plating and polishing industry (SIC code 3471) ranked second, reporting 36.0 million pounds in 1994 and 44.8 million pounds in 1996, although the total was smaller (33.1 million pounds) in 1995. The plumbing fixture fittings and trim industry (SIC code 3432) reported the third-largest increase, from 1.6 million pounds to 8.9 million pounds. The primary component of all three industries' increases was on-site recycling.

On-site waste management data for 1994-1996 appear in Table 12-15.

### Transfers Off-site for Further Waste Management

The metal cans industry (SIC code 3411) ranked first for decreases in transfers off-site for further waste management from 1994 to 1996 (data for some types of off-site transfers were not collected in 1988). This industry reported 16.5 million pounds in 1994 and 10.8 million pounds in 1996. Miscellaneous fabricated metal products (SIC code 3499) ranked second, decreasing from 17.8 million pounds to 12.4 million pounds. The multiple-codes group ranked third, reporting 52.7 million pounds in 1994 and 48.7 million pounds in 1996. For both the miscellaneous fabricated metal products industry and the multiple-codes group, the 1995 levels were higher (18.2 million pounds and 68.7 million pounds, respectively). In all three industry groups, transfers to recycling accounted for the majority of the reduction.



## Chapter 12 — TRI Data for Fabricated Metals

**Table 12-14. TRI On-site and Off-site Releases by 4-digit SIC Code, 1988 and 1994-1996: Fabricated Metals, SIC Code 34**

SIC Code	Industry	Year	On-site Releases				Total On-site Releases Pounds	Off-site Releases	Total On- and Off-site Releases Pounds
			Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds		Transfers Off-site to Disposal Pounds	
3411	Metal Cans	96	23,314,059	5	7	19	23,314,090	59,341	23,373,431
		95	27,235,626	0	9	0	27,235,635	55,474	27,291,109
		94	28,822,995	0	8	0	28,823,003	21,637	28,844,640
		88	36,052,557	0	500	80,500	36,133,557	1,465,777	37,599,334
3412	Metal Barrels, Drums, & Pails	96	2,231,300	0	0	6,252	2,237,552	0	2,237,552
		95	2,327,732	0	0	12,594	2,340,326	36,413	2,376,739
		94	3,164,033	0	0	10,310	3,174,343	54,162	3,228,505
		88	4,927,647	250	0	150,355	5,078,252	150,608	5,228,860
3421	Cutlery	96	681,224	5	0	250	681,479	83,229	764,708
		95	709,197	5	0	1,342	710,544	70,289	780,833
		94	681,687	0	0	1,706	683,393	86,430	769,823
		88	1,268,381	0	0	220	1,268,601	34,190	1,302,791
3423	Hand & Edge Tools, nec*	96	362,004	280	0	20	362,304	43,042	405,346
		95	386,140	267	0	0	386,407	44,518	430,925
		94	686,059	255	0	10	686,324	39,977	726,301
		88	1,240,196	92	0	1,538	1,241,826	115,729	1,357,555
3425	Saw Blades & Handsaws	96	1,283	0	0	0	1,283	7,134	8,417
		95	66,513	0	0	0	66,513	112,197	178,710
		94	67,507	0	0	0	67,507	70,805	138,312
		88	590,018	0	0	0	590,018	50,870	640,888
3429	Hardware, nec*	96	1,216,840	1,509	563	0	1,218,912	472,142	1,691,054
		95	1,211,840	1,258	667	750	1,214,515	334,249	1,548,764
		94	979,696	897	1,117	0	981,710	374,619	1,356,329
		88	3,406,366	4,187	52,780	9,050	3,472,383	3,477,744	6,950,127
3431	Metal Sanitary Ware	96	52,095	10	0	2,555	54,660	127,650	182,310
		95	113,619	260	0	5,692	119,571	12,521	132,092
		94	49,818	275	0	35	50,128	488,437	538,565
		88	225,080	75	0	0	225,155	221,054	446,209
3432	Plumbing Fixture Fittings & Trim	96	68,429	1,592	0	750	70,771	69,729	140,500
		95	74,700	153	0	0	74,853	106,256	181,109
		94	214,313	617	760	5,710	221,400	136,866	358,266
		88	961,953	330	0	0	962,283	1,289,305	2,251,588
3433	Heating Equipment, Except Electric	96	328,585	11	0	5	328,601	2,009	330,610
		95	440,053	10	0	5	440,068	2,697	442,765
		94	449,233	5	0	0	449,238	2,158	451,396
		88	413,631	250	0	0	413,881	23,643	437,524
3441	Fabricated Structural Metal	96	1,587,099	2,299	0	93,326	1,682,724	85,658	1,768,382
		95	1,534,345	573	0	83,333	1,618,251	137,913	1,756,164
		94	1,347,934	22	0	29,914	1,377,870	110,175	1,488,045
		88	3,198,102	500	0	1,000	3,199,602	148,727	3,348,329
3442	Metal Doors, Sash, & Trim	96	1,962,929	0	0	762	1,963,691	0	1,963,691
		95	2,119,315	0	0	368	2,119,683	0	2,119,683
		94	2,290,999	0	0	255	2,291,254	500	2,291,754
		88	3,286,382	380	0	2,480	3,289,242	78,958	3,368,200

**Note:** On-site Releases from Section 5 of Form R and Off-site Releases from Section 6 (transfers off-site to disposal) of Form R. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category.

\*nec: not elsewhere classified.



**Table 12-14. TRI On-site and Off-site Releases by 4-digit SIC Code, 1988 and 1994-1996: Fabricated Metals, SIC Code 34, Continued**

SIC Code	Industry	Year	On-site Releases				Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
			Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds			
3443	Fabricated Plate Work (Boiler Shops)	96	1,402,578	2,706	0	16,787	1,422,071	92,391	1,514,462
		95	1,761,970	1,122	0	7,049	1,770,141	262,628	2,032,769
		94	2,511,766	1,392	0	5,516	2,518,674	337,399	2,856,073
		88	2,907,676	19,766	0	3,036	2,930,478	255,416	3,185,894
3444	Sheet Metal Work	96	1,543,976	4	0	3,727	1,547,707	52,417	1,600,124
		95	1,810,836	0	0	5,280	1,816,116	3,565	1,819,681
		94	1,621,423	0	0	6,375	1,627,798	37,657	1,665,455
		88	1,120,077	0	0	250	1,120,327	33,635	1,153,962
3446	Architectural Metal Work	96	228,778	86	0	0	228,864	108,861	337,725
		95	315,063	250	0	130,000	445,313	5,988	451,301
		94	351,559	250	0	142,200	494,009	4,610	498,619
		88	597,439	250	0	0	597,689	10,347	608,036
3448	Prefabricated Metal Buildings	96	829,116	5	0	14,600	843,721	85,173	928,894
		95	1,590,039	5	0	9,435	1,599,479	143,732	1,743,211
		94	1,902,360	10	0	0	1,902,370	199,813	2,102,183
		88	1,855,897	250	0	250	1,856,397	49,540	1,905,937
3449	Miscellaneous Metal Work	96	404,509	0	0	0	404,509	270	404,779
		95	643,019	0	0	0	643,019	15	643,034
		94	591,795	0	0	0	591,795	775	592,570
		88	970,422	52,800	0	1,250	1,024,472	27,370	1,051,842
3451	Screw Machine Products	96	422,323	520	0	510	423,353	5,259	428,612
		95	504,571	20	0	10	504,601	12,640	517,241
		94	782,309	15	0	28	782,352	16,052	798,404
		88	1,273,027	0	0	500	1,273,527	531,581	1,805,108
3452	Bolts, Nuts, Rivets, & Washers	96	363,972	83	0	0	364,055	81,970	446,025
		95	413,085	80	0	250	413,415	79,125	492,540
		94	456,698	225	0	250	457,173	229,284	686,457
		88	1,817,464	3,052	0	79,567	1,900,083	257,259	2,157,342
3462	Iron & Steel Forgings	96	84,311	3,038	0	27,055	114,404	1,086,282	1,200,686
		95	206,201	2,798	0	27,238	236,237	1,189,045	1,425,282
		94	181,425	2,818	0	26,160	210,403	912,635	1,123,038
		88	237,452	502	0	47,000	284,954	2,030,355	2,315,309
3463	Nonferrous Forgings	96	71,109	6	0	15	71,130	44,077	115,207
		95	72,970	10	0	10	72,990	96,804	169,794
		94	90,705	306	0	10	91,021	88,324	179,345
		88	171,431	25,963	0	0	197,394	81,689	279,083
3465	Automotive Stampings	96	272,034	84	0	1,290	273,408	15,616	289,024
		95	323,889	10	0	15	323,914	14,487	338,401
		94	333,691	10	0	10	333,711	38,723	372,434
		88	864,388	250	0	9,846	874,484	43,193	917,677
3466	Crowns & Closures	96	No reports received						
		95	750	0	0	0	750	0	750
		94	65,405	0	0	729	66,134	0	66,134
		88	995,065	0	0	0	995,065	12,540	1,007,605

**Note:** On-site Releases from Section 5 of Form R and Off-site Releases from Section 6 (transfers off-site to disposal) of Form R. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category.

\*nec: not elsewhere classified.



## Chapter 12 — TRI Data for Fabricated Metals

**Table 12-14. TRI On-site and Off-site Releases by 4-digit SIC Code, 1988 and 1994-1996: Fabricated Metals, SIC Code 34, Continued**

SIC Code	Industry	Year	On-site Releases				Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
			Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds			
3469	Metal Stampings, nec*	96	2,368,960	1,344	0	697	2,371,001	214,646	2,585,647
		95	2,789,488	433	0	273	2,790,194	247,892	3,038,086
		94	2,939,896	1,326	0	280	2,941,502	301,171	3,242,673
		88	3,972,651	543	0	500	3,973,694	662,686	4,636,380
3471	Plating & Polishing	96	3,505,835	6,018	0	184,318	3,696,171	2,707,044	6,403,215
		95	4,027,353	6,661	0	4,625	4,038,639	3,207,460	7,246,099
		94	4,682,848	7,499	0	33,919	4,724,266	3,559,529	8,283,795
		88	8,439,292	377,114	919	3,048,609	11,865,934	5,601,634	17,467,568
3479	Metal Coating & Allied Services	96	8,112,310	26,418	0	30,492	8,169,220	3,059,720	11,228,940
		95	11,146,061	32,497	0	12,892	11,191,450	2,679,565	13,871,015
		94	11,541,567	11,397	0	15,966	11,568,930	2,963,148	14,532,078
		88	6,750,966	2,623	0	57,609	6,811,198	5,118,560	11,929,758
3482	Small Arms Ammunition	96	91,505	15,339	0	0	106,844	222,280	329,124
		95	83,343	34,855	0	42	118,240	84,007	202,247
		94	124,505	24,382	0	1,288	150,175	114,325	264,500
		88	258,100	1,752	0	38,410	298,262	412,168	710,430
3483	Ammunition, Exc. For Small Arms, nec*	96	55,664	0	0	0	55,664	0	55,664
		95	94,205	0	0	0	94,205	0	94,205
		94	225,979	197	0	0	226,176	1,190	227,366
		88	716,938	1,500	0	250	718,688	70,661	789,349
3484	Small Arms	96	44,199	5	0	0	44,204	39,319	83,523
		95	30,232	0	0	0	30,232	38,209	68,441
		94	68,729	0	0	0	68,729	30,985	99,714
		88	223,521	154	0	0	223,675	44,015	267,690
3489	Ordnance & Accessories, nec*	96	78,299	7	0	0	78,306	66	78,372
		95	153,347	22	0	0	153,369	18	153,387
		94	207,055	318	0	12,526	219,899	24,625	244,524
		88	1,530,020	950	0	18,600	1,549,570	10,327	1,559,897
3491	Industrial Valves	96	397,154	271	0	260	397,685	19,568	417,253
		95	461,766	273	0	505	462,544	16,954	479,498
		94	429,057	22	0	0	429,079	10,214	439,293
		88	13,616	0	0	374	13,990	114,300	128,290
3492	Fluid Power Valves & Hose Fittings	96	42,041	0	0	0	42,041	5,805	47,846
		95	113,624	0	0	0	113,624	8,059	121,683
		94	85,335	0	0	0	85,335	8,291	93,626
		88	357,384	0	0	0	357,384	4,160	361,544
3493	Steel Springs, Except Wire	96	77,500	4	0	0	77,504	4,968	82,472
		95	31,680	500	0	500	32,680	5,570	38,250
		94	29,124	500	0	500	30,124	6,432	36,556
		88	149,997	0	0	0	149,997	83,324	233,321
3494	Valves & Pipe Fittings, nec*	96	246,080	657	0	28,387	275,124	63,222	338,346
		95	445,073	1,079	0	16,597	462,749	60,126	522,875
		94	379,483	1,074	0	31,795	412,352	54,039	466,391
		88	2,229,920	2,262	0	18,905	2,251,087	1,118,995	3,370,082

**Note:** On-site Releases from Section 5 of Form R and Off-site Releases from Section 6 (transfers off-site to disposal) of Form R. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category.

\*nec: not elsewhere classified.



**Table 12-14. TRI On-site and Off-site Releases by 4-digit SIC Code, 1988 and 1994-1996: Fabricated Metals, SIC Code 34, Continued**

SIC Code	Industry	Year	On-site Releases				Total On-site Releases Pounds	Off-site Releases	Total On- and Off-site Releases Pounds
			Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds		Transfers Off-site to Disposal Pounds	
3495	Wire Springs	96	12,602	0	0	0	12,602	12,372	24,974
		95	26,772	0	0	0	26,772	12,853	39,625
		94	106,676	0	0	0	106,676	19,180	125,856
		88	118,327	0	0	0	118,327	1,726	120,053
3496	Misc. Fabricated Wire Products	96	846,804	4,093	0	434	851,331	699,516	1,550,847
		95	1,172,130	719	0	524	1,173,373	163,763	1,337,136
		94	1,283,568	1,692	0	250	1,285,510	181,894	1,467,404
		88	2,747,779	11,345	0	59,491	2,818,615	1,315,814	4,134,429
3497	Metal Foil & Leaf	96	358,873	550	0	66,300	425,723	40,523	466,246
		95	532,665	1,732	0	0	534,397	41,434	575,831
		94	481,614	1,048	0	0	482,662	38,802	521,464
		88	1,246,449	421	0	0	1,246,870	42,391	1,289,261
3498	Fabricated Pipe & Fittings	96	632,902	4,045	0	97,784	734,731	95,250	829,981
		95	625,758	5,081	5	253,208	884,052	83,997	968,049
		94	786,877	8,526	0	220,192	1,015,595	10,417	1,026,012
		88	895,559	30	0	25,020	920,609	52,527	973,136
3499	Fabricated Metal Products, nec*	96	5,329,824	2,411	0	16,559	5,348,794	257,456	5,606,250
		95	5,989,579	2,150	0	18,480	6,010,209	417,962	6,428,171
		94	6,554,956	2,721	0	18,706	6,576,383	309,456	6,885,839
		88	13,588,763	82,133	0	72,521	13,743,417	1,276,892	15,020,309
	Multiple within SIC Code 34	96	4,286,514	5,694	0	134,907	4,427,115	1,284,358	5,711,473
		95	5,207,361	7,308	0	40,604	5,255,273	1,456,899	6,712,172
		94	6,737,816	5,265	0	48,591	6,791,672	1,643,991	8,435,663
		88	10,574,515	10,985	0	252,669	10,838,169	3,146,626	13,984,795
	Invalid SIC Code within SIC Code 34	96	1,588,217	169	0	0	1,588,386	50,435	1,638,821
		95	1,597,955	30	0	250	1,598,235	73,039	1,671,274
		94	1,943,309	35	0	10,149	1,953,493	93,161	2,046,654
		88	3,432,687	32,730	100,000	11,475	3,576,892	497,375	4,074,267
	Total for SIC Code 34	96	65,503,836	79,268	570	728,061	66,311,735	11,298,798	77,610,533
		95	78,389,865	100,161	681	631,871	79,122,578	11,318,363	90,440,941
		94	86,251,804	73,099	1,885	623,380	86,950,168	12,621,888	99,572,056
		88	125,627,135	633,439	154,199	3,991,275	130,406,048	29,963,711	160,369,759

**Note:** On-site Releases from Section 5 of Form R and Off-site Releases from Section 6 (transfers off-site to disposal) of Form R. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category.

\*nec: not elsewhere classified.



## Chapter 12 — TRI Data for Fabricated Metals

**Table 12-15. TRI Other On-site Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Fabricated Metals, SIC Code 34**

SIC Code	Industry	Year	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Total Other On-site Waste Management Pounds
3411	Metal Cans	96	258,637	6,163,803	22,829,437	29,251,877
		95	293,875	4,889,951	20,608,164	25,791,990
		94	307,740	3,864,648	23,299,886	27,472,274
		88	NA	NA	NA	NA
3412	Metal Barrels, Drums, & Pails	96	87,895	1,247,496	312,318	1,647,709
		95	201,708	1,445,459	883,816	2,530,983
		94	220,659	1,713,714	1,536,250	3,470,623
		88	NA	NA	NA	NA
3421	Cutlery	96	46,457,548	0	0	46,457,548
		95	64,387,100	0	0	64,387,100
		94	110,554,000	1,365,532	8,000	111,927,532
		88	NA	NA	NA	NA
3423	Hand & Edge Tools, nec*	96	403	0	785,907	786,310
		95	2,476	0	190,000	192,476
		94	10,055	0	101,805	111,860
		88	NA	NA	NA	NA
3425	Saw Blades & Handsaws	96	0	0	0	0
		95	528	0	4,530	5,058
		94	528	0	3,750	4,278
		88	NA	NA	NA	NA
3429	Hardware, nec*	96	6,289,366	29,981	515,788	6,835,135
		95	6,967,251	53,624	501,789	7,522,664
		94	7,147,007	51,389	792,431	7,990,827
		88	NA	NA	NA	NA
3431	Metal Sanitary Ware	96	942,805	0	43,000	985,805
		95	1,981,600	0	47,000	2,028,600
		94	2,740,000	0	51,000	2,791,000
		88	NA	NA	NA	NA
3432	Plumbing Fixture Fittings & Trim	96	8,769,918	0	125,655	8,895,573
		95	2,078,221	0	164,023	2,242,244
		94	1,338,720	0	233,084	1,571,804
		88	NA	NA	NA	NA
3433	Heating Equipment, Except Electric	96	2,464	0	0	2,464
		95	2,950	0	0	2,950
		94	2,810	0	0	2,810
		88	NA	NA	NA	NA
3441	Fabricated Structural Metal	96	64,522	0	31,811	96,333
		95	123,310	0	6,289	129,599
		94	300,500	0	47,209	347,709
		88	NA	NA	NA	NA
3442	Metal Doors, Sash, & Trim	96	36,070	0	28,368	64,438
		95	79,391	0	67,286	146,677
		94	71,383	0	360,069	431,452
		88	NA	NA	NA	NA

**Note:** Data from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the “multiple” category. One facility reported incorrectly in SIC code 3999 for 1996. The facility should have reported in SIC code 3499. The incorrectly reported amounts were as follows: 3,209,200 pounds of recycling on-site, 573 pounds of treatment on-site and 3,209,773 pounds of other on-site waste management.

\*nec: not elsewhere classified.



**Table 12-15. TRI Other On-site Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Fabricated Metals, SIC Code 34, Continued**

SIC Code	Industry	Year	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Total Other On-site Waste Management Pounds
3443	Fabricated Plate Work (Boiler Shops)	96	5,105	0	1,410,471	1,415,576
		95	9,550	0	1,535,500	1,545,050
		94	6,675	0	1,298,050	1,304,725
		88	NA	NA	NA	NA
3444	Sheet Metal Work	96	68,155	335,100	482,190	885,445
		95	45,416	359,166	578,798	983,380
		94	476,356	263,720	850,990	1,591,066
		88	NA	NA	NA	NA
3446	Architectural Metal Work	96	14,168	0	136,136	150,304
		95	48,884	0	187,832	236,716
		94	29,252	0	169,613	198,865
		88	NA	NA	NA	NA
3448	Prefabricated Metal Buildings	96	6,208,600	0	252,118	6,460,718
		95	6,200,400	0	256,116	6,456,516
		94	6,207,800	0	266,377	6,474,177
		88	NA	NA	NA	NA
3449	Miscellaneous Metal Work	96	168,070	0	123,262	291,332
		95	0	0	72,562	72,562
		94	0	0	78,117	78,117
		88	NA	NA	NA	NA
3451	Screw Machine Products	96	135,700	94,003	197,222	426,925
		95	224,446	0	363,976	588,422
		94	188,722	81,829	303,488	574,039
		88	NA	NA	NA	NA
3452	Bolts, Nuts, Rivets, & Washers	96	28,450	2,100,000	677,436	2,805,886
		95	35,450	0	509,945	545,395
		94	28,185	0	543,423	571,608
		88	NA	NA	NA	NA
3462	Iron & Steel Forgings	96	1,806,295	0	116,304	1,922,599
		95	1,795,000	0	172,047	1,967,047
		94	616,000	10,330	91,791	718,121
		88	NA	NA	NA	NA
3463	Nonferrous Forgings	96	12,789,900	0	66,464	12,856,364
		95	66,800	0	150,377	217,177
		94	76,577	0	206,160	282,737
		88	NA	NA	NA	NA
3465	Automotive Stampings	96	16,848	0	224,856	241,704
		95	33,715	0	235,800	269,515
		94	27,381	0	170,431	197,812
		88	NA	NA	NA	NA
3466	Crowns & Closures	96	No reports received			
		95	0	0	0	0
		94	52,830	0	0	52,830
		88	NA	NA	NA	NA

**Note:** Data from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category. One facility reported incorrectly in SIC code 3999 for 1996. The facility should have reported in SIC code 3499. The incorrectly reported amounts were as follows: 3,209,200 pounds of recycling on-site, 573 pounds of treatment on-site and 3,209,773 pounds of other on-site waste management.

**\*nec:** not elsewhere classified.



## Chapter 12 — TRI Data for Fabricated Metals

**Table 12-15. TRI Other On-site Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Fabricated Metals, SIC Code 34, Continued**

SIC Code	Industry	Year	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Total Other On-site Waste Management Pounds
3469	Metal Stampings, nec*	96	993,999	2,091	665,833	1,661,923
		95	1,091,295	2,372	446,501	1,540,168
		94	1,795,266	522	728,054	2,523,842
		88	NA	NA	NA	NA
3471	Plating & Polishing	96	19,810,694	13,266	24,979,119	44,803,079
		95	8,629,140	14,792	24,437,215	33,081,147
		94	9,868,600	0	26,173,498	36,042,098
		88	NA	NA	NA	NA
3479	Metal Coating & Allied Services	96	645,002	9,999,980	20,495,570	31,140,552
		95	663,769	8,988,691	26,845,295	36,497,755
		94	1,070,017	9,874,535	28,172,972	39,117,524
		88	NA	NA	NA	NA
3482	Small Arms Ammunition	96	500	0	409,152	409,652
		95	500	0	501,520	502,020
		94	500	0	622,525	623,025
		88	NA	NA	NA	NA
3483	Ammunition, Exc. For Small Arms, nec*	96	0	0	0	0
		95	0	0	0	0
		94	3,025	0	0	3,025
		88	NA	NA	NA	NA
3484	Small Arms	96	0	0	12,896	12,896
		95	3,566	0	30,397	33,963
		94	0	0	20,031	20,031
		88	NA	NA	NA	NA
3489	Ordnance & Accessories, nec*	96	1,000	0	17,500	18,500
		95	5,300	0	20,000	25,300
		94	13,555	0	45,870	59,425
		88	NA	NA	NA	NA
3491	Industrial Valves	96	7,980	0	50,000	57,980
		95	6,680	0	6	6,686
		94	6,280	0	20,008	26,288
		88	NA	NA	NA	NA
3492	Fluid Power Valves & Hose Fittings	96	600	0	7,900	8,500
		95	600	0	3,671	4,271
		94	600	0	2,070	2,670
		88	NA	NA	NA	NA
3493	Steel Springs, Except Wire	96	0	0	0	0
		95	0	0	0	0
		94	0	0	0	0
		88	NA	NA	NA	NA
3494	Valves & Pipe Fittings, nec*	96	14,223,712	0	45,367	14,269,079
		95	13,565,186	0	76,315	13,641,501
		94	8,632,474	1,000	68,233	8,701,707
		88	NA	NA	NA	NA

**Note:** Data from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the “multiple” category. One facility reported incorrectly in SIC code 3999 for 1996. The facility should have reported in SIC code 3499. The incorrectly reported amounts were as follows: 3,209,200 pounds of recycling on-site, 573 pounds of treatment on-site and 3,209,773 pounds of other on-site waste management.

\*nec: not elsewhere classified.





**Table 12-15. TRI Other On-site Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Fabricated Metals, SIC Code 34, Continued**

SIC Code	Industry	Year	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Total Other On-site Waste Management Pounds
3495	Wire Springs	96	25,000	0	0	25,000
		95	25,000	0	0	25,000
		94	37,600	0	0	37,600
		88	NA	NA	NA	NA
3496	Misc. Fabricated Wire Products	96	283,909	0	300,921	584,830
		95	732	0	295,209	295,941
		94	20,636	0	503,818	524,454
		88	NA	NA	NA	NA
3497	Metal Foil & Leaf	96	539,848	0	4,518,981	5,058,829
		95	428,107	1,363,000	3,678,721	5,469,828
		94	186,926	1,258,948	3,875,782	5,321,656
		88	NA	NA	NA	NA
3498	Fabricated Pipe & Fittings	96	8,000	0	194,025	202,025
		95	67,710	0	168,053	235,763
		94	22,710	0	83,068	105,778
		88	NA	NA	NA	NA
3499	Fabricated Metal Products, nec*	96	2,211,011	0	1,945,324	4,156,335
		95	2,452,031	770	2,141,963	4,594,764
		94	61,910,007	145,796	2,688,407	64,744,210
		88	NA	NA	NA	NA
	Multiple within SIC Code 34	96	23,284,902	522,460	6,090,065	29,897,427
		95	25,062,439	1,960,808	4,412,996	31,436,243
		94	44,181,211	1,801,172	4,829,329	50,811,712
		88	NA	NA	NA	NA
	Invalid SIC Code within SIC Code 34	96	33,476	468,800	963,799	1,466,075
		95	224,367	273,404	813,476	1,311,247
		94	387,592	293,900	637,289	1,318,781
		88	NA	NA	NA	NA
	Total for SIC Code 34	96	146,220,552	20,976,980	89,055,195	256,252,727
		95	136,804,493	19,352,037	90,407,188	246,563,718
		94	258,540,179	20,727,035	98,882,878	378,150,092
		88	NA	NA	NA	NA

**Note:** Data from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the “multiple” category. One facility reported incorrectly in SIC code 3999 for 1996. The facility should have reported in SIC code 3499. The incorrectly reported amounts were as follows: 3,209,200 pounds of recycling on-site, 573 pounds of treatment on-site and 3,209,773 pounds of other on-site waste management.

\*nec: not elsewhere classified.



The plumbing fixture fittings and trim industry (SIC code 3432) reported the sector's largest increase for 1994 to 1996. This industry reported an increase from 26.7 million pounds to 41.5 million pounds. The miscellaneous metal stampings industry (SIC code 3469) reported 24.9 million pounds in 1994 and 31.3 million pounds in 1996, the second-largest increase. Ranking third, the screw machine products industry (SIC code 3451) reported an increase from 12.1 million pounds to 17.8 million pounds. In all three industries, the increases were principally attributable to transfers to recycling.

Table 12-16 presents data for the fabricated metals sector's reporting of transfers off-site for further waste management from 1988 to 1996.

#### *Facilities with Large Increases and Decreases in Releases, 1988-1996*

Metal Container Corporation in New Windsor, New York (SIC code 3411), ranked first in increases of releases with 808,000 pounds. A manufacturer of aluminum can bodies (for end use by beer and soft drink producers), this facility reported a 455,000 pound increase in air emissions of glycol ethers between 1988 and 1996 (56% of the overall change). The chemical is a solvent in the coatings used to decorate and protect the cans, according to the facility contact. The solvent is emitted to the air when the coated cans are dried in curing ovens. The facility contact attributed the facility's ranking to lower production in 1988. The facility was built in 1988 and did not reach full production by the end of the reporting year. The contact also stated that the facility plans, this year, to install control equipment that will reduce future air emissions by over 40%.

Metal Impact Corporation in Rosemont, Illinois (did not report in 1988, SIC code 3499 in 1996), was second in increases with 636,000 pounds. Because the facility did not report in 1988, the

increase is equal to total releases reported in 1996. Air emissions of tetrachloroethylene accounted for 99.9% of the 1996 releases. The facility contact chose not to comment on the chemical's usage or the reason for the increase.

U.S. Can Company in Weirton, West Virginia (SIC code 3411), ranked third with an overall increase of 581,000 pounds. The metal sheet coating and printing facility uses glycol ethers as a wash-up solvent and as a constituent of the coatings and varnishes applied to metal sheets. The facility contact stated that these solvents, coatings, and varnishes are purchased from outside suppliers. Reported air emissions of the chemical accounted for 71% of the facility's increase. Two reasons were given for the increase: coating and varnish consumption has increased and the facility switched to butyl cellosolve, a glycol ether, as its primary wash-up solvent.

Plateco, Inc., in Reedsburg, Wisconsin (SIC code 3471 in 1988, did not report in 1996), was first in decreases of releases with 4.0 million pounds. The facility is a zinc-plating job shop. Metal fasteners for the automotive industry are among Plateco's primary products. Releases of chromium compounds totaled 1.5 million pounds in 1988. The facility did not submit a Form R in 1995 or 1996. No information was provided by the facility before the deadline for this publication.

Double Eagle Steel Coating Company in Dearborn, Michigan (SIC code 3479), ranked second in decreases with 2.9 million pounds. A manufacturer of electrogalvanized steel automotive body parts, the facility reported no releases of zinc compounds in 1996, accounting for nearly 100% of the decrease. Zinc is the primary constituent of the coating used in the metal galvanization process. Excess zinc compounds were formerly transferred off-site for disposal but are now purified and sold as a product to a battery manufacturer, according to the facility contact.



**Table 12-16. TRI Transfers Off-site for Further Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Fabricated Metals, SIC Code 34**

SIC Code	Industry	Year	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds	Other Off-site Transfers Pounds	Total Transfers Off-site for Further Waste Management Pounds
3411	Metal Cans	96	6,045,016	4,434,501	300,786	1,982	13,800	10,796,085
		95	11,521,736	4,171,986	110,661	8,010	0	15,812,393
		94	11,935,395	4,389,916	136,549	3,798	0	16,465,658
		88	NA	NA	1,755,052	218,686	8,113	NA
3412	Metal Barrels, Drums, & Pails	96	181,164	979,125	19,549	10	0	1,179,848
		95	102,989	1,143,273	247,185	3,806	0	1,497,253
		94	140,621	1,332,243	104,655	4,296	0	1,581,815
		88	NA	NA	1,353,410	7,200	260,375	NA
3421	Cutlery	96	415,202	0	10,818	284	0	426,304
		95	280,749	0	9,375	1,226	0	291,350
		94	402,856	1,638	5,394	2,059	0	411,947
		88	NA	NA	6,040	0	0	NA
3423	Hand & Edge Tools, nec*	96	590,467	3,220	67,074	1,917	0	662,678
		95	274,081	5,047	109,287	1,927	0	390,342
		94	686,609	9,334	99,899	3,698	0	799,540
		88	NA	NA	173,253	4,160	27,788	NA
3425	Saw Blades & Handsaws	96	119,133	0	1,018	13	0	120,164
		95	327,713	0	0	4,598	0	332,311
		94	358,113	0	250	3,811	0	362,174
		88	NA	NA	35,583	2,831	0	NA
3429	Hardware, nec*	96	9,533,569	7,370	121,996	22,763	0	9,685,698
		95	6,744,170	7,034	150,720	17,662	0	6,919,586
		94	6,643,029	10,076	143,052	12,441	0	6,808,598
		88	NA	NA	508,572	368,953	49,639	NA
3431	Metal Sanitary Ware	96	358,251	0	52,941	22	0	411,214
		95	359,829	9,779	181,137	3,817	0	554,562
		94	638,894	5,595	72,838	28	0	717,355
		88	NA	NA	20	1,004	0	NA
3432	Plumbing Fixture Fittings & Trim	96	41,274,389	5,949	165,735	7,167	5	41,453,245
		95	32,062,748	0	166,514	4,279	0	32,233,541
		94	26,344,433	2,460	321,396	8,533	0	26,676,822
		88	NA	NA	111,477	12,631	3,250	NA
3433	Heating Equipment, Except Electric	96	524,113	147,482	14,284	774	0	686,653
		95	763,284	110,324	22,718	530	0	896,856
		94	779,515	155,720	23,651	285	0	959,171
		88	NA	NA	16,008	764	300,000	NA
3441	Fabricated Structural Metal	96	7,105,567	282,509	99,094	29,297	0	7,516,467
		95	902,918	125,160	88,015	25,850	0	1,141,943
		94	1,792,731	175,457	46,463	4,040	0	2,018,691
		88	NA	NA	111,335	83,704	803	NA

**Note:** Transfers Off-site for Further Waste Management from Section 6 (excluding transfers off-site to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category.

\*nec: not elsewhere classified.



## Chapter 12 — TRI Data for Fabricated Metals

**Table 12-16. TRI Transfers Off-site for Further Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Fabricated Metals, SIC Code 34, Continued**

SIC Code	Industry	Year	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds	Other Off-site Transfers Pounds	Total Transfers Off-site for Further Waste Management Pounds
3442	Metal Doors, Sash, & Trim	96	110,123	271,698	45,742	320	0	427,883
		95	89,833	202,873	42,620	290	0	335,616
		94	85,456	205,524	31,696	10,048	250	332,974
		88	NA	NA	221,494	3,377	0	NA
3443	Fabricated Plate Work (Boiler Shops)	96	4,515,842	43,886	151,680	37,751	31,482	4,780,641
		95	3,980,552	71,703	212,642	14,497	0	4,279,394
		94	4,541,085	76,517	173,431	55,742	90,287	4,937,062
		88	NA	NA	27,740	135,575	5	NA
3444	Sheet Metal Work	96	791,565	76,117	97,337	78,683	5	1,043,707
		95	1,455,902	61,362	235,020	69,530	0	1,821,814
		94	1,667,157	52,333	245,438	32,867	500	1,998,295
		88	NA	NA	283,452	11,590	30,085	NA
3446	Architectural Metal Work	96	384,716	2,177	35,475	15	0	422,383
		95	342,728	67,081	0	0	0	409,809
		94	362,961	71,406	15	15	0	434,397
		88	NA	NA	49,040	3,925	78,750	NA
3448	Prefabricated Metal Buildings	96	126,109	21,152	12,866	755	250	161,132
		95	79,152	64,044	16,022	255	0	159,473
		94	107,191	79,055	6,699	10	0	192,955
		88	NA	NA	50,645	500	1,500	NA
3449	Miscellaneous Metal Work	96	221,576	7,832	3,900	6	0	233,314
		95	180,118	57,081	1,100	47,980	0	286,279
		94	194,963	24,532	0	44,373	0	263,868
		88	NA	NA	83,407	250	0	NA
3451	Screw Machine Products	96	17,710,495	17,194	64,610	1,199	0	17,793,498
		95	13,495,796	91,953	19,230	903	0	13,607,882
		94	11,917,443	48,614	86,560	843	55,128	12,108,588
		88	NA	NA	267,130	16,877	17,781	NA
3452	Bolts, Nuts, Rivets, & Washers	96	740,302	19,047	31,498	2,693	0	793,540
		95	747,803	15,333	34,852	3,366	0	801,354
		94	812,175	7,578	77,521	3,766	33,155	934,195
		88	NA	NA	479,683	55,142	4,358	NA
3462	Iron & Steel Forgings	96	15,728,051	22,785	129,873	13,575	0	15,894,284
		95	19,336,512	748	121,616	20,638	0	19,479,514
		94	13,714,985	10,777	99,528	16,827	3,430	13,845,547
		88	NA	NA	62,223	102,954	0	NA
3463	Nonferrous Forgings	96	1,628,596	459	331,012	1,747	0	1,961,814
		95	1,624,444	968	215,188	3,815	0	1,844,415
		94	2,669,772	0	24,178	1,527	0	2,695,477
		88	NA	NA	514,250	188,746	0	NA

**Note:** Transfers Off-site for Further Waste Management from Section 6 (excluding transfers off-site to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category. \*nec: not elsewhere classified.



**Table 12-16. TRI Transfers Off-site for Further Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Fabricated Metals, SIC Code 34, Continued**

SIC Code	Industry	Year	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds	Other Off-site Transfers Pounds	Total Transfers Off-site for Further Waste Management Pounds
3465	Automotive Stampings	96	10,743,633	62,147	49,906	33,612	0	10,889,298
		95	9,899,277	71,123	122,533	25,087	0	10,118,020
		94	9,568,013	89,425	53,079	5,834	0	9,716,351
		88	NA	NA	204,730	48,897	264,200	NA
3466	Crowns & Closures	96	No reports received					
		95	0	0	0	0	0	0
		94	0	37,100	27,750	0	0	64,850
		88	NA	NA	38,390	500	0	NA
3469	Metal Stampings, nec*	96	30,736,747	301,491	189,218	91,182	5,452	31,324,090
		95	26,786,427	291,442	152,540	110,697	0	27,341,106
		94	24,340,949	187,745	235,176	114,160	0	24,878,030
		88	NA	NA	467,019	1,004,872	1	NA
3471	Plating & Polishing	96	17,633,721	418,158	4,385,981	222,678	250	22,660,788
		95	14,008,357	640,711	2,695,609	205,735	21,990	17,572,402
		94	17,596,775	572,808	2,575,412	211,741	1,250	20,957,986
		88	NA	NA	2,325,740	1,928,136	381,261	NA
3479	Metal Coating & Allied Services	96	21,889,673	4,300,916	1,633,099	1,464,948	0	29,288,636
		95	27,661,672	4,626,145	1,530,203	1,015,950	77,750	34,911,720
		94	25,217,167	4,543,399	2,079,082	508,995	0	32,348,643
		88	NA	NA	3,098,204	460,521	566,805	NA
3482	Small Arms Ammunition	96	7,068,030	10,176	82,660	3,263	0	7,164,129
		95	7,921,453	4,241	51,811	2,787	0	7,980,292
		94	10,957,260	10,649	114,740	3,768	0	11,086,417
		88	NA	NA	1,945	9,750	52,000	NA
3483	Ammunition, Exc. For Small Arms, nec*	96	234,205	1,095	1,205	0	0	236,505
		95	245,500	0	3,505	0	0	249,005
		94	209,797	25,981	514	130	0	236,422
		88	NA	NA	84,049	750	750	NA
3484	Small Arms	96	408,092	12,279	39,496	119	0	459,986
		95	153,947	15,007	28,650	10	0	197,614
		94	91,164	14,877	25,905	5	0	131,951
		88	NA	NA	102,557	142	2,500	NA
3489	Ordnance & Accessories, nec*	96	80,100	200	5,630	73	0	86,003
		95	142,984	550	17,946	34	0	161,514
		94	241,750	1,720	21,200	36	0	264,706
		88	NA	NA	106,420	25,444	0	NA
3491	Industrial Valves	96	3,854,842	1,001	2,525	8,355	0	3,866,723
		95	4,908,065	282	3,520	6,031	0	4,917,898
		94	5,274,399	133	1,796	13,863	0	5,290,191
		88	NA	NA	0	0	59,978	NA

**Note:** Transfers Off-site for Further Waste Management from Section 6 (excluding transfers off-site to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category. \*nec: not elsewhere classified.

**Table 12-16. TRI Transfers Off-site for Further Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Fabricated Metals, SIC Code 34, Continued**

SIC Code	Industry	Year	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds	Other Off-site Transfers Pounds	Total Transfers Off-site for Further Waste Management Pounds
3492	Fluid Power Valves & Hose Fittings	96	2,588,247	6,702	1,143	24,906	0	2,620,998
		95	3,378,959	6,297	15,624	13,188	0	3,414,068
		94	3,053,272	6,550	19,612	13,357	0	3,092,791
		88	NA	NA	250	615	0	NA
3493	Steel Springs, Except Wire	96	39,687	0	0	0	0	39,687
		95	39,055	0	0	0	0	39,055
		94	106,764	0	3,000	0	0	109,764
		88	NA	NA	5,300	1,500	0	NA
3494	Valves & Pipe Fittings, nec*	96	23,507,538	8,683	69,197	2,122	0	23,587,540
		95	24,480,591	3,726	97,631	1,826	0	24,583,774
		94	19,096,723	9,059	88,116	3,551	0	19,197,449
		88	NA	NA	82,874	10,259	453,434	NA
3495	Wire Springs	96	34,287	5,337	0	25	0	39,649
		95	24,074	7,176	5,296	25	0	36,571
		94	30,869	0	3,312	25	0	34,206
		88	NA	NA	500	2,099	0	NA
3496	Misc. Fabricated Wire Products	96	4,433,511	17,829	493,284	15,446	0	4,960,070
		95	4,793,620	17,355	399,396	11,311	0	5,221,682
		94	4,131,061	17,489	203,650	14,636	0	4,366,836
		88	NA	NA	430,851	27,657	1,000	NA
3497	Metal Foil & Leaf	96	6,902,837	855,826	461,935	3,625	17,400	8,241,623
		95	7,942,154	936,568	378,345	0	0	9,257,067
		94	9,141,279	712,113	289,894	0	0	10,143,286
		88	NA	NA	949,999	1,418	2,310	NA
3498	Fabricated Pipe & Fittings	96	3,562,584	255	68,744	564	0	3,632,147
		95	2,696,403	10,115	386,748	1,386	0	3,094,652
		94	3,260,904	2,310	328,539	16,740	0	3,608,493
		88	NA	NA	180,611	12,248	2,056	NA
3499	Fabricated Metal Products, nec*	96	11,315,170	252,790	723,652	136,393	0	12,428,005
		95	16,827,327	611,273	614,381	168,817	516	18,222,314
		94	16,280,483	477,411	700,151	308,928	0	17,766,973
		88	NA	NA	1,454,680	280,606	2,691,269	NA
	Multiple within SIC Code 34	96	47,216,141	608,809	666,815	178,826	2,900	48,673,491
		95	66,928,862	746,374	795,924	199,099	0	68,670,259
		94	50,830,296	786,297	780,940	277,427	1,370	52,676,330
		88	NA	NA	2,041,925	187,742	264,096	NA
	Invalid SIC Code within SIC Code 34	96	1,727,460	327,042	229,988	357	0	2,284,847
		95	1,650,058	113,462	11,013	567	0	1,775,100
		94	1,547,092	36,549	25,813	69,342	0	1,678,796
		88	NA	NA	712,357	355,543	39,626	NA
	Total for SIC Code 34	96	302,080,751	13,533,239	10,861,766	2,387,467	71,544	328,934,767
		95	315,161,842	14,307,596	9,294,577	1,995,529	100,256	340,859,800
		94	286,771,401	14,190,390	9,276,894	1,771,545	185,370	312,195,600
		88	NA	NA	18,398,215	5,577,568	5,563,733	NA

**Note:** Transfers Off-site for Further Waste Management from Section 6 (excluding transfers off-site to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 34 are assigned to the "multiple" category.  
**\*nec:** not elsewhere classified.



Crown Cork & Seal Company, Inc., in Winchester, Virginia (SIC code 3411), was third in decreases with 2.4 million pounds. Metal is cut and coated to customer specifications at this plant. Reported reductions in air emissions of xylene (mixed isomers), a constituent of solvent-based coatings and used as a wash-up solvent, accounted for 76% of the facility's total decrease. Coating processes were eliminated at the plant resulting in a significant reduction in xylene usage.

### 1991-1996 Waste Management Data for Fabricated Metals

Table 12-17 summarizes on- and off-site waste management data for the fabricated metals sector for 1991, when TRI began collecting this information, and the three most recent years (1994-1996). From 1991 to 1996, the sector reported a 5.9% increase in total production-related waste, from 639.3 million pounds to 676.8 million pounds.

This 37.5 million-pound increase in total production-related waste reflected a larger increase in reporting of off-site recycling, partly offset by sizable reductions in on-site recycling and quantities released. The sector reported 233.2 million pounds of off-site recycling in 1991 and 318.6 million pounds in 1996, an increase of 36.6% or 85.4 million pounds. At the same time, on-site recycling decreased 13.0%, from 168.0 million pounds to 146.2 million pounds (a 21.8 million-pound reduction), and quantities released decreased 34.8%, from 118.4 million pounds to 77.2 million pounds (a 41.2 million-pound reduction).

Other waste management types showed smaller absolute changes. The sector reported increases in on-site energy recovery (from 17.2 million pounds to 21.0 million pounds), on-site treatment (from 76.5 million pounds to 89.1 million pounds), and off-site energy recovery (from 12.9 million pounds to 13.4 million pounds). These increases ranged

from 22.3% for on-site energy recovery to 3.9% for off-site energy recovery. The sector reported a 13.1% decrease in off-site treatment (from 13.1 million pounds to 11.4 million pounds).

Figure 12-13 shows the percentage changes for on- and off-site waste management types.

These changes indicate substantial improvement in the fabricated metals sector's management of TRI chemicals in waste over time. Specifically, they show a shift from releases to recycling. The proportion of total production-related waste reported as releases decreased (from 18.5% in 1991 to 11.4% in 1996), while the proportion of total production-related waste recycled on- and off-site increased (from 62.8% to 68.7%). In terms of the waste management hierarchy (explained in Chapter 1), recycling is the most desirable method for managing waste that cannot be prevented, while releases are the least desirable waste management option.

### Facilities with Large Increases and Decreases in Waste Management, 1991-1996

American Safety Razor, Inc., in Verona, Virginia (SIC code 3421), ranked first in increases of waste managed with a 40.7 million-pound increase. A manufacturer of products ranging from industrial razor blades to surgical scalpels, the facility uses trichloroethylene as a degreaser. Reported on-site recycling of the chemical accounted for 100% of the increase. According to the facility contact, the increase in on-site recycling was likely due to a change in interpretation of how to report this category.<sup>1</sup>

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<sup>1</sup> There are no TRI regulatory definitions of recycling. Facilities may use their own interpretations for purposes of reporting to TRI. Changes in these interpretations do not represent a change in guidance by EPA on how to report recycling.



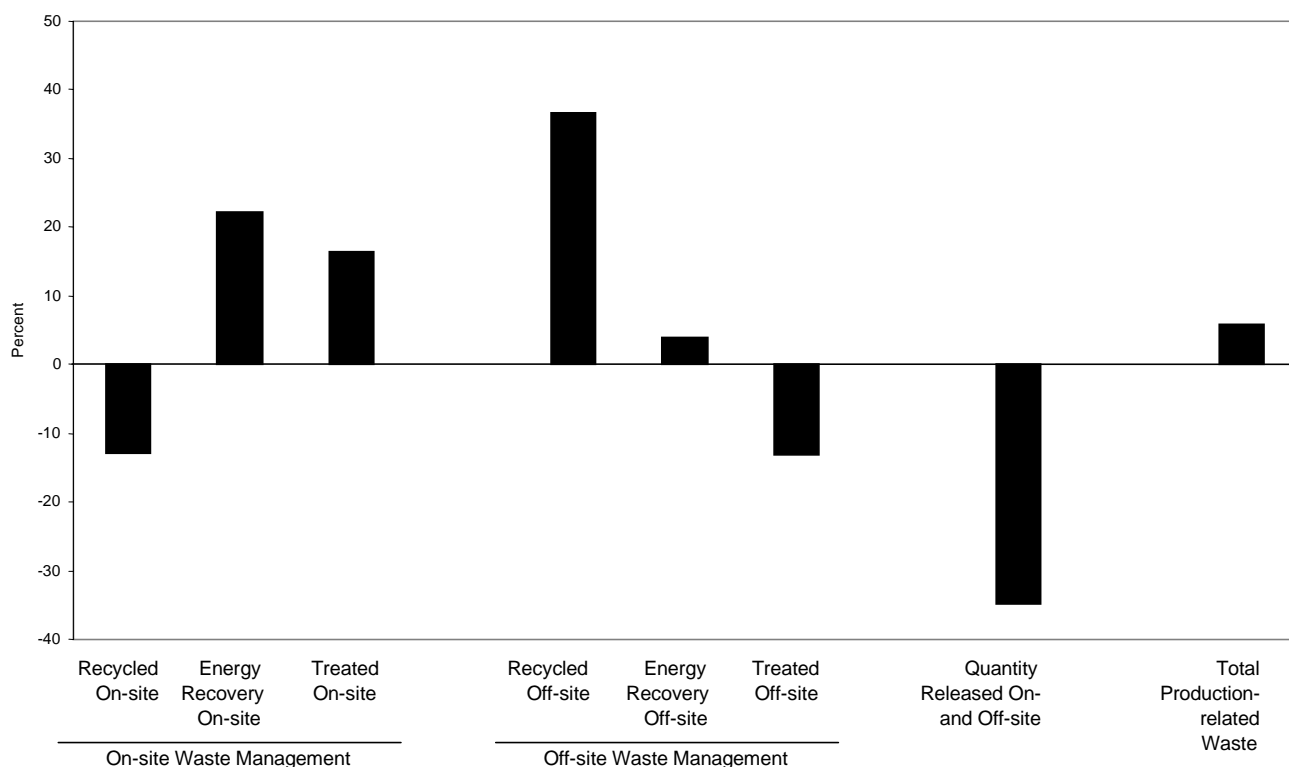
## Chapter 12 — TRI Data for Fabricated Metals

**Table 12-17. TRI Waste Management Data, 1991, 1994-1996: Fabricated Metals, SIC Code 34**

Waste Management Activity	1991 Pounds	1994 Pounds	1995 Pounds	1996 Pounds
<u>On-site Waste Management</u>				
Recycled On-site	168,024,776	258,540,179	136,804,493	146,220,552
Energy Recovery On-site	17,153,824	20,727,035	19,352,037	20,976,980
Treated On-site	76,466,086	98,882,878	90,407,188	89,055,195
Total On-site Waste Management	261,644,686	378,150,092	246,563,718	256,252,727
<u>Off-site Waste Management</u>				
Recycled Off-site	233,163,866	298,902,616	315,297,383	318,552,041
Energy Recovery Off-site	12,944,794	14,307,407	14,530,472	13,448,619
Treated Off-site	13,103,332	11,540,713	11,208,922	11,389,617
Total Off-site Waste Management	259,211,992	324,750,736	341,036,777	343,390,277
Quantity Released On- and Off-site	118,413,991	100,079,501	89,133,446	77,165,101
Total Production-related Waste	639,270,669	802,980,329	676,733,941	676,808,105
Non-Production-related Waste	908,811	94,112	185,465	144,777
Waste Management Activity	Change 1994-1995 Percent	Change 1995-1996 Percent	Change 1991-1996 Percent	
<u>On-site Waste Management</u>				
Recycled On-site	-47.1	6.9	-13.0	
Energy Recovery On-site	-6.6	8.4	22.3	
Treated On-site	-8.6	-1.5	16.5	
Total On-site Waste Management	-34.8	3.9	-2.1	
<u>Off-site Waste Management</u>				
Recycled Off-site	5.5	1.0	36.6	
Energy Recovery Off-site	1.6	-7.4	3.9	
Treated Off-site	-2.9	1.6	-13.1	
Total Off-site Waste Management	5.0	0.7	32.5	
Quantity Released On- and Off-site	-10.9	-13.4	-34.8	
Total Production-related Waste	-15.7	0.0	5.9	
Non-Production-related Waste	97.1	-21.9	-84.1	

**Note:** Does not include delisted chemicals, chemicals added in 1994 and 1995, ammonia, hydrochloric acid, and sulfuric acid. Data from Section 8 of Form R (Current Year, Column B) of year indicated.





**Figure 12-13. Percentage Change in Quantities of TRI Chemicals in Waste, 1991-1996: Fabricated Metals (SIC Code 34)**

**Note:** Does not include delisted chemicals, chemicals added in 1994 and 1995, ammonia, hydrochloric acid, and sulfuric acid. Data from Section 8 of Form R (Current Year, Column B) of year indicated.

Ilco Unican Corporation in Rocky Mount, North Carolina (SIC codes 3429, 3469, 3471), was second in increases with 12.3 million pounds. Reported on- and off-site recycling of copper compounds accounted for 79% of the increase. No data were reported in either category in 1991. This facility manufactures keys and produces brass on site. Copper is a constituent of brass. The facility contact stated that no recycling data were reported for copper compounds in 1991 because the recycling system had not yet been implemented.

A.Y. MacDonald Manufacturing Company in Dubuque, Iowa (SIC code 3494), was the third ranking facility with an 11.7 million-pound increase. A manufacturer of brass castings, this facility provides service products for oil, water, and gas service industries. On- and off-site recycling of copper between 1991 and 1996

increased a reported 11.0 million pounds (94% of the overall increase). Excess brass is remelted and recast at the plant. The facility contact stated that two reasons likely contributed to the increase: a change in interpretation of how to calculate recycling data<sup>2</sup> and a production increase.

Warner-Lambert Company in Milford, Connecticut (SIC code 3421), ranked first in decreases of waste managed with a 70.5 million-pound decrease. The facility, a razor blade manufacturer, replaced a solvent degreasing

<sup>2</sup> There are no TRI regulatory definitions of recycling. Facilities may use their own interpretations for purposes of reporting to TRI. Changes in these interpretations do not represent a change in guidance by EPA on how to report recycling.



system with an aqueous cleaning process. The process substitution resulted in the elimination of trichloroethylene usage at the plant. In 1991, 70.4 million pounds of trichloroethylene were managed as waste.

Double Eagle Steel Coating Company in Dearborn, Michigan (SIC code 3479), was second in decreases with 40.7 million pounds. The facility also ranked second in decreases of releases (see "Facilities with Large Increases and Decreases in Releases, 1988-1996"). The manufacturer of galvanized metal auto-body parts formerly sent zinc waste off-site for recycling. Prior to the 1996 reporting year, the facility began purifying zinc from waste and selling it as a product to a battery manufacturer. This process and a reporting interpretation change resulted in a 40.6 million-pound decrease in reported waste management of zinc compounds. No data were reported for zinc in 1996. Aeroquip Corporation in Van Wert, Ohio (SIC code 3429, 3471, 3492), was third in decreases with 3.7 million pounds. The manufacturer of industrial connectors reported 2.2 million-pounds less off-site recycling of copper in 1996 than 1991. This accounted for 61% of the overall change. The reason for the decrease was elimination of some products, according to the facility contact.

### **Other Apparent Increases and Decreases in Production-Related Waste, 1991-1996**

In the TRI database, there are other facilities with large apparent increases and decreases, which have been identified as reporting errors or plant closures. Because these are errors or plant closures and not actual changes in the data, these facilities are not discussed in detail here. There is one such facility in the metal finishing sector:

Signet Systems, Inc., Harrodsburg, Kentucky, decrease of 43.9 million pounds, reported incorrect SIC code.

### **Facilities Contacted for Explanations (alphabetical by facility):**

A.Y. MacDonald Manufacturing Company, Dubuque, Iowa: Jim Houtakker, October 15, 1998 (explanation provided)

Aeroquip Corporation, Van Wert, Ohio: Brian Delucenay, October 19, 1998 (explanation provided)

American Safety Razor, Inc., Verona, Virginia: Thomas N. Gay, October 15, 1998 (explanation provided)

Crown Cork & Seal Company, Inc., Winchester, Virginia: Charles M. Heck, October 19, 1998 (explanation provided)

Double Eagle Steel Coating Company, Dearborn, Michigan: Andrew Yaksic, September 29, 1998 (explanation provided)

Ilco Unican Corporation, Rocky Mount, North Carolina: Brian E. Wells, September 29, 1998 (explanation provided)

Metal Container Corporation, New Windsor, New York: Bob Lanham, October 22, 1998 (explanation provided)

Metal Impact Corporation, Rosemont, Illinois (no explanation provided)

Plateco, Inc., Reedsburg, Wisconsin (no explanation provided)

Signet Systems, Inc., Harrodsburg, Kentucky: Stephen J. Evans, September 4, 1998 (explanation provided)

U.S. Can Company, Weirton, West Virginia: Scott McCuen, September 29, 1998 and Nathan Sohocki, October 2, 1998 (explanation provided)

Warner-Lambert Company, Milford, Connecticut: Scott Sutkowski, September 4, 1998 (explanation provided)

